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**SCHOOL GOVERNMENT AND THE DETERMINANTS OF THE FISCAL SUPPORT
FOR LARGE CITY EDUCATION SYSTEMS.**

BY- RANNEY, DAVID C.

SOUTHERN ILLINOIS UNIV., EDWARDSVILLE

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**AN ANALYSIS WAS MADE OF THE DETERMINANTS OF LARGE CITY
EDUCATIONAL FISCAL POLICY. A WIDE RANGE OF PROBLEMS AND
ISSUES WERE PRESENTED WHICH EVOLVED FROM THE METROPOLITAN
CONTEXT WITHIN WHICH LARGE CITY SCHOOL SYSTEMS OPERATE. THE
STUDY FOUND THAT THE FORM OF SCHOOL GOVERNMENT IN LARGE
CENTRAL CITIES WAS A RELATIVELY UNIMPORTANT FACTOR IN THE
SUPPORT OF PUBLIC EDUCATION. THE RELATIONSHIP BETWEEN
EDUCATIONAL AND NONEDUCATIONAL EXPENDITURES, HOWEVER, WAS
SIGNIFICANT. (TC)**

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Cooperative Research Project No. 6-8211

**David C. Ranney
Southern Illinois University
Edwardsville, Illinois**

1967

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PREFACE

This study has been financed by the Office of Education, Washington, D. C. under their cooperative research grant program. In addition, this project has been conducted as a part of the Large City Education Systems Project undertaken by the Metropolitan Studies Program, Maxwell Graduate School, Syracuse University, and sponsored by Carnegie Corporation of New York. The study has benefited considerably from the facilities and exceptional talents of the participants in the larger project. Many of the statistical computations have been made possible through the use of the IBM 7070 Computer facilities and the library programs of the Syracuse University Computing Center.

The focus of this inquiry has been on the importance of school government relative to other determinants of educational fiscal outputs in large city school systems. More broadly, the analysis has dealt with the determinants of educational expenditures, taxes and the allocation of public resources between education and other local functions. While this topic, strictly speaking, is most directly relevant to the field of educational finance, it is clear that it has much broader implications to all students of urban and metropolitan affairs and to those public officials who are responsible for making policy that affects the metropolis.

The analysis of the determinants of large city educational fiscal behavior contained in the following pages has covered a wide range of problems and issues that evolve from the metropolitan context within which large city school systems operate. As a student of planning, the author has viewed this study as an opportunity to engage in a kind of urban analysis that is seldom done in the planning process but which has exceedingly important implications for the planner and the work which he does.

From the planner's point of view there are two ways of looking at public schools. The usual involvement of the planner with the school has been in deciding appropriate school locations, projecting future requirements for educational facilities, and generally viewing the school as a dependent variable whose needs are determined by the nature of the community. Alternatively, however, the school can be considered as an independent variable that has a real impact on the socio-economic character of the community.¹ For many, the quality of the school system may be an important factor in their choice of residence. Beyond this, moreover, the school is an important element of any community's environmental quality. Thus, a knowledge of the factors that are responsible for the nature of the school system (measured in fiscal terms) is important to the planner. Finally, with all of the recent interest

¹Nathan Glazer, "The School as an Instrument in Planning," American Institute of Planners Journal (November, 1959), pp. 191-95; Fred Rosenberg, "Intra-Regional Failures in School Planning," American Institute of Planners Journal (Winter, 1957), pp. 55-59.

in "social planning," the relationships explored in this study have a further relevance to planning and urban analysis generally. The character of urban education is a crucial element of the social fabric of our cities. For these reasons it is hoped that the present analysis can spark greater interest among all students of metropolitan areas in the problems and issues involved with the provision of public education in large central cities.

There are a number of individuals to whom I would like to express my gratitude for their assistance with this study. My colleague, Philip Meranto, spent many lunch hours and evenings reading and discussing the study with me and offering many useful substantive suggestions. I am grateful to Professor Jesse Burkhead for his suggestions and encouragement. To Professor Alan K. Campbell, Director of the Metropolitan Studies Program and the Large City Education System Project, I owe a special debt. Professor Campbell read the entire manuscript and offered many suggestions on both its form and substance. Professor Seymour Sacks contributed a great deal of time and thought to this project. His reading of the study and subsequent suggestions have improved not only the substance of this study but my knowledge of quantitative methods and

public finance as well. I am very grateful to him. Finally, I wish to thank my wife, Roberta, for her many suggestions on the study and for sharing with me the joys and frustrations that are a part of the research and writing process.

David C. Ranney

Edwardsville, Illinois
January, 1967

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CHAPTER I

SCHOOL GOVERNMENT AND THE SETTING OF
LOCAL EDUCATIONAL FINANCE

Introduction

The objective of this study is a greater understanding of the financing of public elementary and secondary education in the largest cities of the United States. The focus of the analysis is the relative importance of governmental structure to other factors, with respect to the issues of local public educational finance. That element of governmental structure which is most relevant to educational finance is the "independence" or "dependence" of the school systems. In 1962 the U.S. Bureau of the Census showed that of the 37,019 school systems in the United States, 2,341 were considered to be "dependent" or a part of another political jurisdiction. The rest of the school systems were called "independent" because they operated as separate governmental jurisdictions with their own power

of taxing and budget formulation.

For more than a century educators have been engaged in a dialogue with political scientists and economists over the question of whether school systems should be independent of other governmental jurisdictions or whether they should be part of these jurisdictions. Basically, the educators have contended that public education should be free from all control of other governments. The political scientists and economists have argued that public resources cannot be efficiently allocated and competing demands on the public fisc cannot be effectively weighed without the existence of a single authority to consider all of the local demands on a given tax base. In the course of the present study it will become clear that this debate has been preoccupied with a matching of value positions and has given very little empirical attention to the question of whether the existence of one kind of school system or the other actually makes any difference.

In the pages to follow, an analysis will be made of the determinants of variations in educational

expenditures and taxes and in the allocation of resources between educational and non-educational services. Using statistical methods, these determinants will then be held constant in order to discover whether or not governmental structure, as represented by the independence or dependence of local school systems, has an impact on educational fiscal behavior. The concern here with governmental structure suggests two specific questions which will be explored in the course of this study. They are: What is the effect of the independence or dependence of school systems on the taxes and expenditures of these systems, and how does independence or dependence affect the relationship between educational and non-educational local public expenditures? The answers to these questions will be sought only with respect to large central cities in metropolitan areas.

With regard to the broader involvement of this study with the determinants of educational fiscal behavior, two kinds of issues will be explored. One is the educational issue or the struggle to provide the large city inhabitants with a level of educational service that meets their demands.

Roughly speaking, the relative differences in the level of educational services being provided may be measured by educational expenditures per student. A second concern may be termed the fiscal issue which itself consists of two parts. On the one hand, there is the effort and burden that the people of a given community must assume in order to provide a given level of education to the children of that community. The total effort can be measured in terms of educational expenditures per capita; and burden can be measured by educational taxes. The second aspect of the fiscal issue involves the allocation of resources to the various kinds of services which are being provided by local governments. Here the reasons for variations that exist among school systems in the relationship between educational and other kinds of expenditures made by local governments are sought.

The importance of exploring the questions and issues discussed above can best be demonstrated by first looking at some historical developments in the demand for and the financing of public elementary and secondary education.

, The Growing Demand for Public Elementary
and Secondary Education

Since the turn of the century, there has been a growing demand in the United States for public elementary and secondary education. This growth is largely accounted for by the fact that a greater and greater proportion of those enrolling in the public schools in a given year are staying in school for the duration of that year. It is also true that enrollment itself has grown and that the length of the school year has increased. These trends are demonstrated in Table 1. The proportion of enrollees attending school daily increased from 68.6 percent in 1900 to 90.7 percent in 1962, and the total days attended per pupil has grown from 99.0 to 163.3 during the same time period.

In Table 1 it can also be seen that the brunt of the increase in the demand for public education has been felt in the high schools. The proportion of the total enrollment that is accounted for by high schools was only 3.3 percent in 1900 while in 1962 it had grown to 25.0 percent.

TABLE 1
ABSOLUTE AND RELATIVE ENROLLMENT AND ATTENDANCE
1900-1962^a

Year	Enrollment (000)	Percent of Enrolled Students Attending Daily	Total Days Attended Per Enrolled Pupil	Percent of Total Enrollment in High School
1899- 1900	15,503	68.6	99.0	3.3
1909- 1910	17,814	72.1	112.9	5.1
1919- 1920	21,579	74.8	121.2	10.2
1929- 1930	25,678	82.8	143.0	17.1
1939- 1940	25,434	86.7	151.7	26.0
1949- 1950	25,111	88.7	157.9	22.7
1959- 1960	36,087	90.0	160.2	23.5
1961- 1962	38,253	90.7	163.3	25.0

^aKenneth A. Simon and W. Vance Grant, Digest of Educational Statistics, U.S. Department of Health, Education, and Welfare (Washington: U.S. Government Printing Office, 1965), Table 5.

All of these figures show the increasing demand for educational facilities in terms of the relative increase in persons going to and staying in school. Another way of showing this growth is by looking at the fiscal response to the increased number of pupils. This response, in terms of local educational expenditures for public schools, is shown in Table 2. The table demonstrates that such expenditures have increased since 1902 absolutely, and relative to other local expenditures as well. Of particular interest here is the fact that since 1902 local governments have consistently been placing a greater relative emphasis on the education function in terms of the proportion of public resources allocated to that function. Local expenditures for education as a proportion of all local expenditures was 27.1 percent in 1902. By 1962 the proportion had risen to 44.8 percent, or to nearly half of local public expenditures. Much of this considerable reallocation of resources has occurred in the past decade during which education's share of local expenditures rose from 38.8 percent to 44.8 percent. This reallocation

TABLE 2
LOCAL EXPENDITURES FOR LOCAL PUBLIC SCHOOLS
1902-1962^a

Year	Total Educational Expenditures (\$ millions)	Relative Growth in Educational Expenditures (1902 = 100)	Educational Expenditures as a Percent of Total Local Expenditures
1902	238	100	27.1
1913	522	219	29.5
1922	1,541	647	36.8
1927	2,017	847	34.6
1932	2,033	854	31.0
1938	2,144	901	34.7
1944	2,304	983	37.2
1948	4,298	1,805	37.4
1952	6,737	2,831	38.8
1957	11,545	4,850	43.6
1960	14,977	6,293	44.7
1962	17,538	7,369	44.8

^aU.S. Bureau of the Census, Census of Governments, 1962, Historical Statistics in Governmental Finances and Employment (Washington: U.S. Government Printing Office, 1962), Table 6.

represented a growth rate in educational expenditures between 1952 and 1962 of 160.2 percent. The comparable rate of growth for educational expenditures per student was 71.3 percent, demonstrating that all of this growth was not simply a reflection of an increase in the number

of people in school.

Another indicator of the nature of the fiscal response to the increased demand for education is the relationship between educational expenditures for local schools and personal income. In 1942 state and local governments spent \$18.33 per \$1,000 personal income for local schools. By 1957 the figure had risen to \$33.40, and in 1962 it was \$40.32.¹

The above analysis has demonstrated that the demand for elementary and secondary education has been continuously increasing since 1900. Local resources, however, have not always been sufficient to pay the costs involved. In spite of the many liberal diatribes against the state governments and dire predictions that such governments are dying,² states have paid a significant share of the growing costs of public education. Table 3 shows that state aid to local schools has increased both absolutely and also as a proportion of local expenditures for education. This increase in this proportion has been from 18.9 percent in 1902 to 36.1 percent in 1962, although

¹U.S. Bureau of the Census, Census of Governments, 1962, Historical Statistics in Governmental Finances and Employment (Washington: U.S. Government Printing Office, 1962), Table 20, 6.

²See, for example, Christopher Jencks, "Why Bail Out the States," New Republic (December 12, 1964), pp. 8-10.

in the past decade the proportion has held almost constant.

TABLE 3
STATE AID TO LOCAL SCHOOLS FOR SELECTED YEARS
1902-1962^a

Year	Educational State Aid (\$ millions)	Educational Aid as a Percent of Local Educational Expenditures
1902	45	18.9
1913	82	15.7
1922	202	13.1
1927	292	14.5
1932	398	19.6
1938	656	30.6
1944	861	37.4
1948	1,554	36.2
1952	2,523	37.0
1957	4,212	35.7
1960	5,461	35.6
1962	6,474	36.1

^aU.S. Bureau of the Census, Census of Governments, 1962, Historical Statistics on Governmental Finances and Employment (Washington: U.S. Government Printing Office, 1962), Table 5.

Traditionally, the federal government has shied away from any extensive involvement with elementary and secondary education. Their aid has been limited to relatively small categorical payments which in 1962 amounted to \$337 million, or only 1.9 percent of all expenditures for elementary and

secondary education. Considerable debate has occurred through the years over whether the federal government should extend "general" aid to local schools. Bills of such nature, however, have historically met with heavy opposition to the extent that political experts, until recently, have predicted that such a bill was unlikely to pass in the foreseeable future.¹ In 1965, however, an act of unprecedented scope was passed. Its effect will be to nearly triple present federal aid to education. Exactly why this bill passed is a complex question, but it is clear that the ice has been broken and one might well expect increased federal involvement in the future.²

The above analysis demonstrates that there has been a general increase in the demand for public elementary and secondary education, and an increase in expenditures that reflects a greater allocation of funds to local schools. Although the fiscal response to the increased demand for education has been strong in the aggregate, the response has been uneven. It is, in fact, the variations in school

¹ Frank J. Munger and Richard F. Fenno, Jr., National Politics and Federal Aid to Education (Syracuse: Syracuse University Press, 1962).

² A study of the passage of this act is presently being undertaken by Philip Meranto as a part of the Carnegie sponsored Large Cities Education Systems Study, Maxwell Graduate School, Metropolitan Studies Program, Syracuse University.

expenditures that have received considerable attention in the educational finance literature. It is apparent from this literature that disparities among school systems in their ability to meet their needs, as well as disparities in the needs to be met, have existed for the entire duration of the period of expansion described above.¹

To illustrate the variations in school support, a sample of 37 of the largest city school systems has been taken and the mean, standard deviation, coefficient of variation, and the range of variation have been computed for a number of fiscal characteristics. The results are shown in Table 4. The average relative variation for total and current expenditures per student and per capita is about 25 percent, involving ranges from lowest to highest expenditures of up to \$621 per student and \$133 per capita. These school systems also vary in the proportion of local expenditures devoted to education, from 18.8 percent to 46.1 percent, with a coefficient of variation of 19 percent. Per student state aid to education varies tremendously. The coefficient of variation here is 41 percent and payments range from

¹ Forrest W. Harrison and Eugene P. McLoone, Profiles in School Support: A Decennial Overview, Office of Education (Washington: U.S. Government Printing Office, 1965).

TABLE 4
 MEAN, STANDARD DEVIATION, COEFFICIENT OF VARIATION
 AND RANGE OF SELECTED FISCAL CHARACTERISTICS FOR
 THIRTY-SEVEN LARGE CENTRAL CITY SCHOOL SYSTEMS,
 1962

	Mean	Standard Deviation	Coefficient of Variation	Range
Total Educational Expenditures Per Student	\$414.46	\$100.47	.24	\$235.17-\$603.95
Total Educational Expenditures Per Capita	\$ 67.96	\$ 16.16	.24	\$ 41.74-\$105.13
Current Educational Expenditures Per Student	\$376.33	\$ 82.46	.22	\$194.43-\$580.05
Current Educational Expenditures Per Capita	\$ 61.73	\$ 13.06	.21	\$ 40.48-\$ 99.17
Educational State Aid Per Student	\$124.92	\$ 51.82	.41	\$ 33.17-\$234.16
Current Educational Expenditures as a Percent of all Current Local Expendi- tures	32.5%	6.2%	.19	18.8%-46.1%
Total Non- Educational Expenditures Per Capita	\$161.70	\$ 53.55	.33	\$ 75.92-\$347.39

\$33.17 to \$234.16 per student. Non-educational expenditures per capita vary even more than educational expenditures. The differences in non-educational expenditures among central cities are largely due to variations among states in the functional responsibilities which they assign to local governments. Welfare is the major function involved. In some states, there are almost no local expenditures for welfare, as the function is handled at the state level, while in other places, welfare is a function of the local governments.¹ The level of non-educational expenditures may have a real impact on educational expenditures. Local governments with relatively less demand for non-educational functions, may be able to devote a greater share of their local resources to education due to the absence of competition from alternative uses of local funds.

In short, Table 4 demonstrates that although expenditures for education have risen over the years, the variation in levels in 1962 is very great. Not only is this true for educational expenditures, but it is also

¹For an analysis of variations in the assignment of functional responsibilities from state to state, see: Yong Hyo Cho, "State-Local Governmental Systems: Their Determinants and Fiscal Implications" (unpublished Ph.D. dissertation, Syracuse University, 1965).

true for state aid and non-educational expenditures which to some extent influence the environment within which decisions about spending for public education must be made.

The discussion above has stressed three circumstances that point up the importance of the questions which this study is attempting to answer. First, there has been an increasing demand for public elementary and secondary education since the turn of the century. Secondly, the fiscal response to this demand has been strong. Finally, there is considerable variation both in levels of educational expenditures and in those aspects of the schools' decision-making environment that are relevant to school support. In view of these different trends and circumstances, it is important to understand why support for schools varies so much. The intensity of the continuing debate over independence versus dependence for schools implies that school governmental structure is an important variable for explaining variation in support. The present study will attempt to discover whether this implication is well grounded in fact.

The Metropolitan Context

Throughout this study, stress will be placed on the fact that the analysis has been put in a metropolitan context. An elaboration of the reasoning behind the choice of a metropolitan context is presented in later chapters. At this point it is simply suggested that the importance of this context is brought out by the fact that America's population is increasingly becoming more concentrated in metropolitan areas. In 1900, 41.9 percent of the population lived in these areas, but by 1950 the proportion had risen to 59.0 percent. Between 1950 and 1960 the proportion jumped to 63.0 percent. At the end of 1965 the figure was 64.4 percent. Between 1960 and 1965 the population growth rate in metropolitan areas was nearly twice as high as that in non-metropolitan areas.¹ Given these changes in the distribution of population, one can make a good case for the idea that most of the increased demand for education discussed above is itself concentrated in the metropolitan areas of the nation.

¹U.S. Bureau of the Census, Americans at Mid Decade (Washington: U.S. Government Printing Office, 1966).

Outline of Presentation

The chapters which follow are designed to provide some answers to the questions asked at the beginning of this chapter. Chapter II deals with the massive literature on the question of school system independence versus dependence. This literature and logical reasoning provide a basis for hypotheses with respect to the initial questions. Chapter III contains a discussion of the methodology, including a more extensive justification for putting this study in a metropolitan context. This chapter will also explain various measures and statistics to be used. In Chapter IV a model of public fiscal decision making is developed in the form of an analytical framework. On the basis of this framework, hypotheses are formed with respect to those variables other than independence-dependence which can contribute to an explanation and understanding of variations in school support. In Chapter V the results of the statistical analysis of these variables are analyzed. Finally, Chapter VI presents some implications of these findings.

CHAPTER II

SCHOOL GOVERNMENT AND THE LITERATURE

The Independence-Dependence Debate

Most of the abundant literature debating the issues of fiscal independence versus dependence for public schools simply repeats a number of stock arguments over and over again. For the purpose of setting the present study in perspective, these classic positions are summarized below. The positions are sometimes argued emotionally, and/or logically, but rarely have they been subjected to empirical testing.¹

The most frequent argument made in favor of independence is that public education is somehow different

¹The arguments summarized below may be found in their original form in the following sources: Educational Policies Commission, "Educational Independence and Human Values," Perspectives on the Economics of Education, ed. Charles S. Benson (Boston: Houghton Mifflin Company, 1963), pp. 122-26; Frederick McLaughlin, "Fiscal Administrative Control of City School Systems," Fiscal Policy for Public Education in the State of New York (Albany, 1947); Charles E. Reeves, School Boards: Their Status Functions and Activities (New York: Prentice-Hall, Inc., 1954); Ralph Yakel, The Legal Control of the Administration of Public School Expenditure (New York: Teachers College, Columbia University, 1929).

from any other local public function. For this reason, it is argued, education should be administered separately from all other local governmental functions. This theme is repeated in many different forms. For example, it is sometimes suggested that because education is so unique, the usual principles of budgetary theory cannot be applied to public schools.

Conventional budget theory holds that the ideal resolution of claims on revenue resources is best found when all claims on tax resources for any related group of functions are considered at one level of responsibility. . . . Such is not the case in education, however, and it is at this point that the professional educator has to part philosophical company with the political scientist and business administrator. The claims of education are clearly qualitative as well as quantitative. The schools cannot apply uniform specifications to their inputs, nor to their processes, nor to their products. They deal with human beings who are as variable in characteristics as they are numerous; and there is no place for more rejects in the human scrap pile.¹

The fact that public education is concerned directly with children is often used by itself as justification for concluding that schools should be handled separately from other local government services.

¹William D. Firman, "Fiscal Independence of School Systems," Paper presented to the Committee on Educational Finance of the National Education Association, Chicago, Illinois, April 7, 1965.

An extension of the above theme is the idea that educational decisions ought to be made by professional educators without interference from politicians or other public servants. The reasoning behind this position is that only educators have the background to judge how much money is needed to provide the community with a first-rate school system. Educators are also considered to be best equipped to control other aspects of education such as the hiring of personnel, curriculum decisions, and the allocation of funds to the various activities that make up the total education budget. Under a dependent school system, many educators fear that their control over such matters would be hampered by the meddling of municipal officials.

A third point that is raised by the independence advocates is that education should be kept free from politics. Since municipalities are generally under the influence of politicians, it is suggested that independence is the only system under which schools can be run effectively.

While arguing that education should be out of the hands of politicians and under the control of professional educators, it is further contended that public schools should also be directly controlled by the people. In school systems that are dependent upon the city, the parental control is said to be more remote, while in independent systems the people have more direct access to their schools.

A final argument used by independence advocates is that legally, education is a state rather than a municipal function and thus any control over a local school system should not come from any source other than the state. Since most state constitutions have direct controls over education, the proponents of this point suggest that legally education cannot be considered a municipal function. The intentions of states with respect to the administration of education is also deduced historically. Frasier makes the point that during the Civil War and up to the late 1800's many states were reducing the power of municipalities by placing various functions under the administration of

separate boards which were authorized directly by the state. In the early 1900's, this trend was reversed and the control of these functions was returned to municipal governments with schools as the lone exception. This proves, so the argument goes, that states do not intend to relinquish the control of local education to municipal governments.¹

Those favoring dependence for schools have their stock arguments, too. In the first place, they do not agree that there is any significant difference between education and other local government services. Further, some dependence advocates suggest that school superintendents and board members are politicians to the same extent as mayors and councilmen. It is also argued that the entire position that politics should be kept out of public education decisions overlooks the fact that public decisions are supposed to be politically determined.²

The most forceful positive argument made in favor of dependence is that efficiency considerations require that all public services in a given community can best be administered under a single general government.

¹G. W. Frasier, The Control of City School Finances (Milwaukee: Bruce Publishing Company, 1922), p. 8.

²Jerry Miner, Social and Economic Factors in Spending for Public Education (Syracuse: Syracuse University Press, 1963), p. 32.

Economists generally take the position that the allocation of resources to and within the public sector ought to be made in a manner that is consistent with the goal of Paretian optimality: to achieve a distribution such that no change to benefit a given individual can be taken without making someone else worse off. Although the "new welfare economists" are in general agreement that this goal is a theoretical impossibility, economists generally favor administrative arrangements that promote decisions which approach this concept of optimality.¹ Where a dependent school system exists, competing claims on community resources can be weighed by a single authority. Under such a system, the benefits and costs of alternative uses of public funds can be effectively weighed and implemented through a public budget. A separate school government is apt to consider only the benefits and costs to the interests of education and not consider the effects of their policies on other local functions. Thus economists often favor the dependent school system.²

¹Richard Musgrave, The Theory of Public Finance (New York: McGraw-Hill Book Company, 1959), p. 84.

²This position is taken by Miner, op. cit., pp. 31-33. An opposite conclusion is reached by another economist, Charles S. Benson, The Economics of Public Education (Boston: Houghton Mifflin Company, 1961), p. 495.

Many political scientists take this same view on similar grounds. They argue for general government at the local level. Specifically, special purpose governments are said to hamper local governments' program support and to make sound fiscal planning an impossibility.¹ The question of support includes the financing of all public services at the local level, not just education. An independent school system may get more support, it is argued, but this may mean that other services at the local level are getting less. The result is a competition for local revenue sources between schools and municipalities. The competition is generally fruitless, so the argument goes, because schools are usually forced to turn to outside sources to finance their growing requirements anyway. Extending the argument to the realm of fiscal planning, the point is often made that when a number of different governmental authorities are making separate decisions (both current and long run capital expenditure decisions) about the way a revenue base will be utilized, it is impossible to plan for the orderly and rational use of that base.

¹Roscoe C. Martin, Government and the Suburban School (Syracuse: Syracuse University Press, 1962), pp. 71-75.

In a general sense, the case for dependence is made on the grounds that all governments will be upgraded by integrating all local governmental functions into one administrative unit. The independence advocates are suggesting that a separate school government will not necessarily hurt local public goods and services, and that separation is necessary in order to maintain a school system of high calibre. All of these stock arguments focus on the question, why adopt one system or the other? The present research is much more concerned with the question, what fiscal difference does the existence of a dependent or independent system actually make? For this reason, no attempt will be made to evaluate the above positions in order to deduce a normative theory of school government. The fact of the matter is that we presently have in the United States both types of arrangements, which makes it possible to find out whether independence or dependence really makes any difference.

Any possible differences caused by one kind of school system or the other can be classified into one of

as well as to test the Margolis hypothesis, described above, that dependent school systems will have higher expenditures.¹

The results of the statistical analysis show the role of the state to be very important in determining the level of school expenditures. The state's position is apparently so strong that it has overshadowed the impact of other important variables. In spite of this, the independence-dependence dummy variable tends to show that independent systems spend more. The result holds for all four dependent variables in the over-all analysis, as well as in those states where there are enough of each kind of system to calculate the coefficients. The results are not strong, however, and could be due to the fact that most of the dependent systems in the sample are also the largest ones. Thus, Miner concludes that while it appears that independent systems spend slightly more, this fact is not necessarily due to independence but could also be caused by a complex of factors that tend to hold down expenditures in the larger systems.

¹Margolis, op. cit., pp. 261-66.

which, in both cases, is called an index of efficiency.¹

The initial difficulty of any study of this sort is constructing a meaningful index. Frasier attempts to do this by enumerating six factors which he feels reflect efficient school operation.² Using a sample of 169 cities, Frasier collapses the six factors into a single efficiency index number for each of these cities. Next, Frasier develops a nine position continuum representing various degrees of independence or dependence. He then calculates the median index number for each of the nine positions on the continuum. Comparing these medians, Frasier observes that as one moves from the first position on the continuum (the most independent schools), to the ninth position (the most dependent), that the median index number falls. He concludes that this means that independent systems are more efficient. He also uses a second method to prove his point. Laying aside the continuum, Frasier classifies the cities in his sample as either independent or dependent and

¹Frasier, op. cit., and J. R. McGaughy, The Fiscal Administration of City School Systems (New York: The Macmillan Company, 1924).

²The drop-out rate, class size, playground space, teacher education level, the proportion of students in school all day in "adequate" buildings, and the relationship between changes in average teacher salaries and changes in the cost of living index.

computes the simple correlation between his index of efficiency and dependent school systems. The coefficient is $-.27$ which, Frasier argues, is further proof that independent systems are more efficient.

Another attempt to relate school efficiency to independence and dependence is made by J. R. McGaughy. McGaughy uses Frasier's index in addition to the six factors upon which the Frasier index is based, and analyzes differences between the two kinds of school systems with a form of variance analysis. In making his comparisons, McGaughy uses a sample of 377 cities and he stratifies this sample both by size and geographical location. Although many of the efficiency variables show "significant" differences between independent and dependent school systems, McGaughy wisely does not try to draw any general conclusions from his findings.

One major problem with both of these efforts to link efficiency to differences in school government is the efficiency measure used. Frasier's index suffers from a number of difficulties. In the first place, it is not

clear that the six factors that make up the index exhaust all of the variables that are important indicators of efficiency. Secondly, the factors chosen are quantified in such a way as to make the reliability of the index extremely dependent on arbitrary rules of the thumb.

Class size, for example, is measured by the percentage of pupils enrolled in elementary classes of fewer than 40 children, and the amount of playground space is measured as the percentage of pupils attending schools with more than 60 square feet of playground space per pupil. Finally, the index itself gives each factor equal weight. Thus, factors such as the drop-out rate and the amount of playground space are considered of equal importance in gauging school efficiency. McGaughy, having used basically the same measures as Frasier, is subject to the same difficulties. In general, the measurement of either efficiency or quality is very intricate and is plagued with numerous problems. The above discussion has tried to highlight the major problems left unsolved

by the Frasier and McGaughy studies.¹

Even if a suitable measure of efficiency could be established, there is yet another difficulty with both the Frasier and McGaughy efforts. The determinants of school efficiency are undoubtedly more numerous than the single variable (independence-dependence) considered by the above studies. In order to assess the effect of the school government structure on efficiency, it is thus necessary to hold constant all of the other relevant factors which could account for variations in efficiency from one school system to another. This is not done by Frasier. McGaughy does try to hold size and geographical location constant by stratifying his sample. The whole problem, however, is likely to be much more complicated than this. Thus, without a multivariate analysis, it is not appropriate to attribute differences in efficiency between independent and dependent systems wholly to the fact that they happen to be independent or dependent.

¹A more detailed discussion of these general problems may be found in Harold F. Clark, Cost and Quality in Public Education (Syracuse: Syracuse University Press, 1962). For an argument against applying efficiency concepts to education and an historical development of efficiency concepts and public education, see, Raymond E. Callahan, Education and the Cult of Efficiency (Chicago: University of Chicago Press, 1962).

The Relationship between Educational
and Non-educational Fiscal Support

As noted earlier, economists and political scientists have defended dependent school systems by using the efficiency argument for general government. The implication of this defense is that the relationship between educational and non-educational fiscal behavior will be different where schools are independent than in those communities where both educational and non-educational functions are under a single government. In spite of heavy reliance on this argument, it has received almost no empirical attention. Martin suggests that one of the results of several governments using the same revenue base is that they come into competition with one another. If schools are prosperous under such arrangement, the city is said to be the loser.

It [the independent school district] leads the assault both on the city's fiscal position and on its capacity to govern. One might, indeed, make a credible case for the proposition that there may be an inverse relation between a prosperous school system and adequate support for the city's service departments.¹

¹Martin, op. cit., p. 73.

In view of such strong conjectures, it is surprising that no one has taken the trouble to look at the relationship between educational and non-educational fiscal support.

Fiscal Support for Schools

Nearly all of the empirical attention given to the subject of independence versus dependence for schools has been concentrated on the question of which kind of arrangement receives greater fiscal support. One approach to the study of the relationship between school support and school government is simply to compare the average values of a number of fiscal characteristics in independent and dependent school districts. This is essentially the approach used by McGaughy.¹ McGaughy's results, however, are not clear. Significant differences between independent and dependent systems were found for some variables but not others. Total educational expenditures, for example, did not show any significant difference. With such uneven results, McGaughy does not even try to draw conclusions about the relationship between school

¹McGaughy, op. cit.

support and either independence or dependence.

A similar approach is taken by Firman, who compares levels of expenditure, wealth and tax rates between dependent school systems and the state averages in the State of New York.¹ Because the average dependent school system is below the state median in expenditures per student and tax rates for schools, and above the median with respect to income, Firman concludes that the independent districts are giving greater support to their schools.²

The general approach of comparing averages of fiscal characteristics between independent and dependent school systems has one rather critical flaw. There are

¹Firman, op. cit.

²It is interesting to note that Julius Margolis, using the same approach as both McGaughy and Firman, comes to the exact opposite conclusion. He looks both at the 41 largest cities in the nation, as well as all of the school systems in New Jersey. In both samples he finds that on the average, the dependent school systems spend more per pupil. He then uses this to support his general hypothesis that a multipurpose government does better fiscally than the single function government, due to greater public willingness to support the multipurpose budget and due to the more general government's presumed ability to maneuver better in a competition for public funds. Julius Margolis, "Metropolitan Finance Problems: Territories, Functions and Growth," in National Bureau of Economic Research, Public Finances: Needs, Sources, and Utilization (Princeton: Princeton University Press, 1962), pp. 261-64.

undoubtedly a large number of factors that can affect the support a community will give, or can give, to its schools. Among these are attitudes toward education on the part of the residents, differences in the cost of education, the strength of the demand for education relative to the demand for other local public services, the wealth of the community, the number of children in school, past school spending decisions, and probably a host of other factors. In short, the fact of independence or dependence is just one of the possible variables that is involved in an understanding of the level of school support. To find out the importance of independence-dependence alone, requires that the effects of the other variables that could affect the support for public education be held constant. Otherwise, a finding that says independent school systems have higher expenditures per pupil than dependent ones may be caused by the existence of a more important variable which itself is functionally unrelated to independence or dependence. In Firman's study, for example, the dependent systems in his sample are also the six largest cities. If

size is a strong determinant of expenditures, then the finding that dependent systems have lower expenditures can be misleading.

An alternative approach that meets this difficulty is the use of multivariate statistical analysis, where variations in a given dependent variable are associated with variations in several independent variables. This technique permits an assessment of the power of each independent variable with the effect of the others held constant.¹

¹An explanation of this technique is presented in Chapter III. There have been a large number of studies which have used multiple regression analysis to explain variations in public expenditures. The discussion below will be limited to those studies that have used independence-dependence as a variable. The other studies have been discussed and summarized in a number of places. See, for example, Miner, *op. cit.*, pp. 37-65 and also Woo Sik Kee, "City Expenditures and Metropolitan Areas: An Analysis of Intergovernmental Fiscal Relations" (unpublished Ph.D. dissertation, Syracuse University, 1964), pp. 17-28. Among the more important contributions to this literature are the following: Solomon Fabricant, The Trend of Government Activity in the United States Since 1900 (New York: National Bureau of Economic Research, 1952); Glen W. Fisher, "Determinants of State and Local Government Expenditures: A Preliminary Analysis," National Tax Journal, XIV (December, 1961), 349-55; Harvey E. Brazier, City Expenditures in the United States (New York: National Bureau of Economic Research, 1959); Seymour Sacks and William F. Hellmuth, Financing Government in a Metropolitan Area (New York: The Free Press of Glencoe, 1961); Miner, *op. cit.*; Seymour Sacks and Robert Harris, "The Determinants of State and Local Government Expenditures and Intergovernmental Flows of Funds," National Tax Journal, XVII (March, 1964), 75-85; Kee, *op. cit.*; Alan K. Campbell and Seymour Sacks, Metropolitan America: Governmental Systems and Fiscal Patterns (to be published in 1966).

This is the approach taken by Jerry Miner, who has used multiple regression analysis to analyze school support in relation to, among other things, independence-dependence.¹ The purpose behind Miner's statistical model is to identify the factors that actually influence the level of expenditures made by local school systems. 'In order to carry out this purpose, Miner uses a sample which includes up to 1,100 local school systems in 23 states. He analyzes their expenditures both by taking all of the school systems together and by looking at educational expenditure behavior on a state by state basis. As dependent variables, four measures of expenditures for education are used: total current expenditures per capita and per student as well as local current expenditures (expenditures less intergovernmental aid) per capita and per student. The general approach is cross section--the year 1959-1960 is used. The model itself views the school system as a decision making unit that is striving to maximize the net benefits of governmental activity to the community through the budget mechanism. Giving public decision makers an economic

¹Miner, op. cit.

motivation, Miner goes on to apply conventional price theory (generally associated with private spending), to public expenditure decisions. He chooses as independent variables factors reflecting the underlying determinants of the quantity (demand) and unit cost (supply) of educational services of similar quality. In addition, Miner adds the concept of legal constraints in order to account for the fact that the public sector has some special institutional arrangements that may also affect the expenditures that can be made. All in all, there are 22 independent variables.

Independence-dependence is treated as a legal constraint. Miner uses a dichotomous measure of this factor and introduces it into the statistical analysis as a dummy variable.¹ Miner's purposes in using independence-dependence in his analysis are to include some measure of the character of the decision making unit

¹The dummy variable enables one to compare interval scale to nominal or ordinal scale data. As Miner used the technique, independent schools were given a value of 1 and dependent of 0. Correlating this with the dependent variables, in effect, dichotomized the sample. The coefficient tells the extent to which one system or another is associated with a consistently higher (or lower) level of expenditure. The same technique can be used when there are more than two classifications of data. This will be taken up in a later chapter.

as well as to test the Margolis hypothesis, described above, that dependent school systems will have higher expenditures.¹

The results of the statistical analysis show the role of the state to be very important in determining the level of school expenditures. The state's position is apparently so strong that it has overshadowed the impact of other important variables. In spite of this, the independence-dependence dummy variable tends to show that independent systems spend more. The result holds for all four dependent variables in the over-all analysis, as well as in those states where there are enough of each kind of system to calculate the coefficients. The results are not strong, however, and could be due to the fact that most of the dependent systems in the sample are also the largest ones. Thus, Miner concludes that while it appears that independent systems spend slightly more, this fact is not necessarily due to independence but could also be caused by a complex of factors that tend to hold down expenditures in the larger systems.

¹Margolis, op. cit., pp. 261-66.

A similar kind of study is by H. Thomas James and his associates.¹ Among the many areas that are covered by this study, a multiple regression analysis of the determinants of educational expenditures is of central importance. The James model is not nearly as elaborate as that formulated by Miner. The idea behind this model is that there are three conditions which are essential to public school support: a set of shared expectations concerning the level of education demanded, sufficient wealth to pay for these expectations, and a governmental system which can provide access to the wealth available and serve as a vehicle for the expression of the community's expectations.

To test these ideas, James has used multiple regression analysis in cross section (1958-1959). The analysis is made on a state by state basis. The dependent variable is current educational expenditures per pupil and there are 19 independent variables reflecting wealth, aspirations, and the governmental system. Independence-dependence is measured dichotomously and inserted into the

¹H. Thomas James, J. Alan Thomas, and Harold J. Dyck, Wealth Expenditure and Decision Making for Education (Stanford: Stanford University Press, 1963).

analysis as a dummy variable. This factor is viewed as one of the variables reflecting the institutional nature of the governmental system.

The results vary considerably from state to state, although the measures of wealth are generally strong. James' findings with respect to the importance of independence-dependence are quite similar to Miner's. He finds that the independent systems spend slightly more than dependent ones. The relationship, however, is not strong and no definite conclusions can be made.

A final statistical study, which discusses the importance of independence-dependence as a determinant of school expenditures, has been prepared by Woo Sik Kee.¹ While both Miner and James use the school system as a unit of analysis, Kee uses the city. He studies the expenditures of local governments made in a sample of 36 central cities. The independence-dependence variable is eliminated from the multivariate analysis due to the fact that the simple correlation shows only a slight positive relationship between independence and school expenditures ($r = .163$).

¹Kee, op. cit.

Nevertheless, this finding is consistent with those of both James and Miner.

The Independence-Dependence Debate--An Evaluation

As suggested above, no attempt is made here to evaluate the normative positions taken by those favoring either independence or dependence for schools. Thus, the remainder of the present chapter evaluates only those studies dealing with the fiscal differences which one kind of school system or the other could possibly make. In the following assessment and criticism of these studies a conscious attempt is made to relate them to the questions outlined in Chapter I. Basically, it is contended here that the existing literature could be improved by: utilizing a more sophisticated classification of independence-dependence, constructing a model which is appropriate to an explanation of governmental decision making, and placing the study in a particular environmental context.

An Independence-Dependence Classification

Nearly all of the literature which either discusses the issues involved in independence versus dependence, or actually tests certain notions about these classifications of school government, uses a dichotomous definition--school systems are simply grouped as independent or dependent. School systems are generally classified as independent when the school board has complete authority to approve the school budget, as well as the power to levy the taxes necessary to raise the funds for this budget. All other school systems are classified as dependent. A number of writers, while using the dichotomous definition for their analysis, have recognized that an appropriate classification of school systems may be more complex than the traditional dichotomy.

J. R. McGaughy, in his research, suggests that there exist "special cities" where the budget review authority rests neither with the school board nor with a municipal authority. He does not, however, suggest what the implication of this fact might be for his analysis.

He also recognizes that the degree of independence or dependence of a given school system is affected by the manner in which school boards are selected--whether they are elected or appointed.¹

Frasier also notes that the classification of school systems is more complex than the simple dichotomy generally in use.² In fact, Frasier is the only writer on the question of independence versus dependence who has used a more complex classification in his analysis. In his study, he suggests that school administrative arrangements can be depicted as a continuum with independence and dependence at the two poles. There are nine classifications on Frasier's continuum. Moving from independence to dependence, the following categories are used: 1) an elected school board with the power to collect and levy taxes; 2) an appointed school board with the power to collect and levy taxes; 3) an elected school board that is dependent on the county for a portion of its funds; 4) an elected school board with the power to collect and levy taxes but which is elected by ward rather than at large; 5) an elected

¹McGaughy, op. cit.

²Frasier, op. cit.

school board with the budget passed upon by the voter; 6) an elected school board with the budget passed upon by a county budget commission; 7) an elected school board which submits its budget to a board of estimate which in turn has the budget reviewed by city council; 8) an appointed school board whose budget is passed upon by a board of estimate; and 9) an appointed board which has no fiscal responsibility and where this responsibility is assumed by the city.

The Frasier continuum is noteworthy because it demonstrates that a number of different kinds of school governments are possible. The criteria used for ordering these different arrangements on a continuum, however, are not spelled out. As a result, it is unclear why these nine particular factors were chosen over others not included, and also why the factors are ordered in the way that they are.

William Firman has also suggested that there are a number of factors involved in classifying a school system according to its degree of independence. He

suggests that "eight practical tests can be used to assess the relative degree of independence of a school system."¹

In the most independent system, he argues, the board of education has the power to establish a budget and to levy the taxes necessary to meet the requirements of the budget. Further, the board must have access to a tax base that is adequate to meet its needs and that any externally imposed limits on the board's ability to tap the base should be very lenient. This leniency should permit the board to raise the tax rate if necessary and to engage in realistic long-range planning. The fiscal powers of the most independent board should be sufficiently flexible to permit the board to be able to adjust to changing educational needs. Firman goes on to suggest that the independent board should have the right to its own accounting system. Finally, citizens and staff in the independent school system should have to deal with a single agency for all matters pertaining to public education. Although Firman clearly recognizes that there are "relative degrees of independence" (or dependence), he fails to place his

¹Firman, op. cit., pp. 10-11.

eight tests into an operational classification system. For his own analysis, he uses the dichotomous measure.

Like Firman, James uses the dichotomy and at the same time discusses the complexity of the independence-dependence classification.¹ James goes further than Firman, stating that the most appropriate classification for analytical purposes is a continuum. He then goes on to develop a scheme for devising a classification system based on the continuum idea. The James model takes account of the fact that there are actually three aspects of independence or dependence--fiscal, political and administrative. In the fiscal realm, budget approval authority may rest in the hands of a school board, a city administration, an electorate or some combination of these. Politically, the school board may be appointed by the state or by a municipal government, or it may be elected locally. Administratively, a school board may be independent of all other governments or it may be dependent on the state or city, or both. James then makes five assumptions: 1) that only school boards have

¹James et al., op. cit., pp. 161-75.

an administrative role; 2) that the school system's administrative staff formulates the budget; 3) all school boards have either budget review or approval authority; 4) the decision makers of all multifunction agencies such as a city are elected; and 5) that all special function agency officials are either elected or appointed by a multifunction agency. James then suggests that there are three relevant kinds of decisions--selection of decision makers, budget review authority, and budget approval authority. Further, he stipulates that these decisions can be made by the following groups--the electorate, a multifunction agency (such as a city), a special function agency (such as a board of estimate), and a school board. This leaves James with 324 possible combinations. By eliminating those combinations which seem unlikely, he narrows the field down to 32.

James never does try to make his model operational by ordering the combinations, nor does he attempt to narrow his categories down further so that a classification system that would be workable for a statistical analysis can be

formulated. For this reason, the James model is never applied. It does, however, offer some insight into the nature of the independence and dependence of school systems.

The work of McGaughy, Frasier, Firman and James suggests that the complexity of school government is such that a classification which is more precise than the usual dichotomy is really needed. As James has pointed out, there are a number of different groups that can potentially make the kinds of decisions that the independence advocates feel should be in the hands of the school board. Aside from cities, the county, the state, or some kind of special agency may have a hand in the decisions that affect public education. Further, those making these decisions may be selected by direct election or by appointment by some other authority which will affect the extent to which the constituency has control over the decisions made about their schools. In short, the responsibility for making many different kinds of decisions that affect the fiscal and administrative aspects of elementary and secondary education can be held in a variety of combinations by a

number of different groups.

There are still other factors that would lead to the conclusion that the independence-dependence classification must be more complex than is generally recognized. There are a number of parameters that determine the amount of fiscal leeway that a given school board has, even if the board has complete control over the levying of taxes and the formulation of the budget. Some states, for example, have salary scales set, and in some school systems the state may perform functions such as health and transportation that are performed locally in other states. Further, in dependent systems it may be difficult to know exactly what the allocation of responsibilities is between school and municipality. Janitorial service, for example, may be handled by a municipal maintenance department or the recreational facilities of schools and municipalities may be shared which could also affect the relative degree of fiscal leeway from one school system to another. A third factor that may have a profound effect on fiscal leeway is the nature of the revenue base.

School systems vary considerably in the extent to which they can rely on state aid. Further, the nature of the local sources of revenues varies and affects the scope of decisions available to the school systems. The availability of non-tax revenue and non-property tax revenue can give school systems varying abilities to pay for education. Most schools rely greatly on the property tax, but even here there are sometimes limitations on the extent to which property may be assessed and taxed under state law. There are obviously variations on the value of the property that can be taxed. All of these factors can affect the leeway, or independence, a school system has in making fiscal and other kinds of decisions.¹

¹The present discussion of the independence-dependence classification has been concerned only with the formal aspects of independence-dependence. It should also be pointed out, however, that there are informal arrangements which could alter the formal classification of a system. A school superintendent, or other members of the school hierarchy, in a formally dependent school system may have a great deal of political power in the community, giving the schools considerable independence over their own affairs. Conversely, members of the school hierarchy in a formally independent system could be affiliated with a political party that is setting limits on the decision-making authority possessed by the school system. If the leader of that party is the mayor, the informal classification of the school system in question would be dependent. In short, a formally dependent system may act as though it were independent and vice versa.

The great number of factors that are involved in determining the relative degree of independence (or dependence) of a given school system suggest to this writer that the traditional dichotomous classification is a gross oversimplification. The fact that all but one of the studies outlined in this chapter have used the dichotomy as a basis for analysis leads to the conclusion that the lack of a more sophisticated classification is a major weakness of the independence-dependence literature to date.

Building an Analytical Model

A second weakness of the literature is the lack of an appropriate analytical framework which can be used to assess the individual effect of independence-dependence on school expenditures and taxes and on the allocation of funds between educational and non-educational services. Such a framework can be useful in selecting and organizing the variables which are relevant to school support. Multiple regression analysis can then be employed to get at the individual importance of each variable selected. The studies

by James, Miner and Kee all use multiple regression analysis as a statistical technique, but they have quite different analytical frameworks. All three of these studies attempt to provide a set of categories that logically reflect the decision making process. Neither James nor Kee, however, attempt to develop a comprehensive explanation of public expenditure decision making but rather put forth a set of convenient categories for classifying their data. Miner's approach is much more elaborate. Rather than using a political framework that assumes political motivation on the part of the decision makers,¹ he makes the assumption that governments strive to maximize the utility of the community, thus taking account of the individual preferences of all members of the community in question. This assumption enables Miner to make use of the advancements of conventional price theory which have been developed to explain private sector economic behavior. Miner argues that public education has its major impact on economic welfare so that the economic rather than the political approach is more appropriate.

¹As Miner suggested, this is the approach that has been used by Anthony Downs, An Economic Theory of Democracy (New York: Harper and Row, 1957).

Although it is true that public spending primarily affects economic welfare, it does not follow that the politicians place the effects of their potential decisions above their desire to be reelected. It is unlikely that the public decision maker is acting under the same set of motivations as the rational consumer in the private sector, with the only difference being that the sovereign consumer is out for himself, while the politician is out for the constituency. It may well be that a politician seeking to maximize votes would maximize the utility of his constituents at the same time. But the primary motivation is different. In short, it does not seem logical to apply the principles of conventional price theory that have been used to describe private sector behavior to the public sector. A framework that is particularly geared to the peculiarities of the behavior of the public decision maker would be more realistic.

In summary, an appropriate analytical framework that provides a comprehensive description of the public expenditure decision-making process is lacking. Miner

is one of the few writers who has attempted to use such a framework as a basis for a study of the determinants of educational expenditures. The weakness of Miner's framework lies in its emphasis on the impact of public spending decisions, rather than on the decisions themselves. In order to construct such a framework it is necessary to take a political approach and attribute political motivation to the decision makers. An attempt to construct such a framework and some further elaboration of this point is made in Chapter IV.

An Environmental Context

With the lone exception of Kee, none of the authors discussed above have attempted to place their studies in any particular environmental context. The school systems included in most samples used serve large central cities, suburban communities, exurban communities, and vast, low density rural areas. Further, these studies have excluded from the analysis the activities of other governments with which a given school system

must share resources. A consideration of the environmental context within which educational fiscal decisions are made could obviously be very important in understanding such decisions. To include communities which have very fundamental environmental differences in the same sample is not desirable because it obscures an important aspect of the decision-making context. Similarly, it is not appropriate to exclude from consideration the claims made by other local services on the public fisc. Thus, the lack of an environmental context in the literature is a distinct weakness.

This point and the rationale behind the choice of a metropolitan context are elaborated further in the following chapter as a justification for the sample used in the present study.

The Literature as a Basis for Forming Hypotheses

Most of the literature discussed above has proceeded on the assumption that the presence of a dependent or an independent school system has some effect on the

level of support for public education. Generally, it is argued that independent school systems tend to have higher expenditures and taxes than dependent ones. Statistically, the studies of Miner, James and Kee all support this conclusion. In none of these studies, however, is the relationship a particularly strong one. Further, all three studies suggest that there could be other variables responsible for the relationships they found. As a matter of fact, all three of these authors point out that the dependent systems in their samples tend to be clustered in the largest size category of school systems, so that it is possible that the statistical relationship between independence and expenditures could be due to size.

The position taken here is that it is highly unlikely that the formal existence of an independent or dependent school system will have any significant effect on the level of educational expenditures or taxes. In the first place, it is reasonable to assume that if the independence-dependence variable has any effect at all on expenditures or taxes it will be only one of many

variables to have such an effect. The question then becomes, is it apt to be important relative to the other variables? If the past multivariate studies can serve as a guide for what can be expected in the present study, the answer is clearly that independence-dependence is not apt to be important relative to these other variables. A second important point is that the classification of a school system as independent or dependent is a very difficult and complicated matter. There are degrees of independence or dependence that depend on a particular combination of different kinds of powers being held by a variety of institutions or groups. In addition, there is the informal aspect of independence or dependence which could cause a group that is independent in a formal sense to act as if it were dependent and vice versa. Finally, there are considerable variations in the leeway that school systems have in making decisions which could also alter the independence that the system has in making fiscal decisions. Because of this complexity, and because there are many other factors that apparently influence

the level of educational expenditures and taxes, a hypothesis that will be tested in the course of this study is that the fact of independence or dependence will not be an important element in the explanation of the level of school expenditures or taxes.

The second question posed in the first chapter concerns the relationship between educational and non-educational expenditures. Here the literature dealing with independence-dependence is of little direct help. While the idea that the presence of an independent school system does affect non-educational expenditures is implicit in the position of those favoring dependence, their assumption has never been rigorously tested. Nevertheless, the logic contained in the dependence advocates' position can form the basis for a hypothesis that can be tested in the present study. In general, this position contends that a dependent school system is needed in order to develop a public budget that effectively weighs the competing claims of alternative uses of public funds. This position implies two

assumptions: that the alternative uses of public funds are in competition with each other for these funds, and that there will be less give and take when the officials with the responsibility for allocating funds to education are under a separate government from those with the responsibility for allocating funds to other local public services. It seems quite reasonable to agree with the second assumption. Where an independent school system exists, the lines of competition can be more clearly drawn, and the schools and other governments can compete for the public funds with more zeal and without the necessity of considering the plight of the other users of the public fisc, and vice versa. The question then hinges on whether or not these two alternative uses of public resources are apt to be in competition with one another.

In order for serious competition to exist, the assumption must be made that resources are "tight" relative to the demand for public goods. In theory, it is clear that the only limit on the amount of resources which can be allocated to the public sector is the total amount of

resources available to both sectors, public and private. Theoretically, all goods and services could be provided publicly. Since the economy of the United States is far from this extreme, it follows that, in a theoretical sense, public resources are not "tight" relative to the demand for public goods. The crucial factor in determining how "tight" a situation actually exists, is the prevailing attitudes in a community toward public goods relative to private goods. If, as Galbraith contends, public goods in our society are considered to be inferior to private goods, one would expect that public spending would be kept to a minimum and the "tight" situation necessary for educational-non-educational competition would indeed exist.¹ In view of the many complaints about tight resources for public spending and the observations made of governments engaging in the "fiscal zoning game," it seems reasonable to go on the assumption that the conditions for educational-non-educational competition

¹John K. Galbraith, The Affluent Society (New York: Mentor Books, 1958), pp. 110-113.

do exist.¹ Going on the assumption that competition of the sort described above exists, the hypothesis can be made that there will be an inverse relationship between educational expenditures and non-educational expenditures. For reasons suggested above, the further hypothesis is proposed that this inverse relationship will be stronger in places served by an independent school system than in those where the schools are relatively dependent.

One might well question the consistency of these hypotheses. If independence-dependence can influence the relationship between educational and non-educational expenditures, would this also have to influence the levels of these expenditures? The answer is, not necessarily. In the second hypothesis, it is only suggested that there may be an inverse relationship between educational and non-educational expenditures which will be greater in independent school systems than in dependent ones. This

¹Robert C. Wood, Metropolis Against Itself (New York: Committee on Economic Development, 1959), p. 32; Regional Plan Association, Spread City: Projection of Development Trends and the Issues They Pose: The Tri-State New York Metropolitan Region, 1960-1965, Regional Plan Association, Bulletin 100, September, 1962, p. 31; Seymour Sacks and Alan K. Campbell, "The Fiscal Zoning Game," Municipal Finance, XXXVI, No. 4 (1964), 140-49.

has little to do with the levels of either kind of expenditure--only with the relationship between them. The levels of these expenditures can be determined by quite different combinations of factors. At the same time, it is being suggested here that both kinds of expenditures will not be able to get all they want and where one kind of expenditure gets more, the other will get less. Further, where the governmental responsibility for these functions is separate and the government getting more does not have to worry about the welfare of the one getting less, the inverse relationship is apt to be even stronger. In short, independence-dependence cannot tell us (under the assumptions of the above hypotheses) who will win the game--but it can tell us something about the intensity with which the game will be played.

CHAPTER III

METHODOLOGY

Introduction

Having discussed the past efforts to assess the importance of school governmental structure, it is now appropriate to set forth the methodology of the present study. It has been suggested in the previous chapter that past studies of school government could be improved by: choosing an appropriate environmental context, devising a more appropriate method of classifying school government, and developing an analytical framework for the study of public educational fiscal behavior. The present methodological chapter consists of three parts-- sample selection, classification of school systems, and statistical methods. Each part is specifically designed to improve upon one of the shortcomings of the past literature.

The Context, the Sample, and
the Unit of Analysis

In Chapter I it was noted that this study has been placed in a metropolitan context. In the previous chapter it was argued that some environmental context is needed in order to avoid comparing different "worlds." At this point, it is appropriate to justify the choice of a metropolitan context. What this choice means in terms of the present study is that central city school systems in large metropolitan areas will be compared to each other and also related to the school systems around them. There are two major points to be made that justify this procedure. First, the issue of independence versus dependence for schools has a special significance in metropolitan areas which is not as applicable outside of the metropolitan context. Secondly, the large central city school systems are now faced with a unique set of difficulties: they have a concentration of disadvantaged students which generate a need for special educational programs and facilities, they lack the resources for

providing education relative to their fiscal needs, and they are faced with a greater responsibility for non-educational services.¹

The Independence-Dependence Issue
in the Metropolitan Context

The presence of independent school systems in metropolitan areas has a special significance which does not apply to their existence in non-metropolitan areas. The independent school district accounts for a major part of the multiplicity of governments which characterizes the metropolis. In 1962 these school districts accounted for 32.5 percent of the total number of governments in metropolitan areas. The multiplicity of governments in the metropolis has disturbed students of metropolitan problems for decades. Those who have advocated general government on efficiency grounds have viewed the structure of government in the metropolis with horror and have even called the governmental structure itself, the

¹The term "unique" is used as a generalization. It is recognized that some school systems outside of the central city have these same problems. The tendency, however, is for central cities to be faced with the difficulties enumerated above and for the school systems outside of the city to be relatively better off.

metropolitan problem. One argument often advanced in this regard is that the sheer number of governments is inefficient and hence adds to the woes of the metropolis. The dependence advocates' position, that independence leads to an inefficient allocation of resources, could and has been made with more vigor in the metropolis.¹ For in this context the independent system is not only sharing its resources with a municipality, but often with a county and one or more special districts as well.²

The Central City Educational Problem

Disadvantaged in the Central City. Since 1900 the population in the United States has become more and more concentrated in metropolitan areas. During the

¹ Roscoe C. Martin, Government and the Suburban School (Syracuse: Syracuse University Press, 1962), pp. 70-71.

² For further discussion of the problems associated with multiplicity and overlapping governmental jurisdictions in metropolitan areas see: Robert C. Wood, Metropolis Against Itself (New York: Committee on Economic Development, 1959); John C. Bollens and Henry J. Schmandt, The Metropolis, Its People, Politics, and Economic Life (New York: Harper and Row, 1965); Roscoe C. Martin and Douglas Price, The Metropolis and Its Problems (Syracuse: Syracuse University, 1959); and Jesse Burkhead, "Metropolitan Area Budget Structures and Their Significance for Expenditures," Proceedings of the Fifty-second Annual Conference on Taxation, National Tax Association (Houston, Texas, October 25-29, 1959), pp. 279-96.

early part of this century most of this population was located in central cities. But since the 1940's there has been a population movement out of the city and into the outlying areas of the metropolis. This trend is shown in Table 5.

TABLE 5

METROPOLITAN POPULATION AS A PROPORTION OF U.S. TOTAL,
CENTRAL CITY (CC) POPULATION AS A PROPORTION OF
METROPOLITAN, OUTSIDE CENTRAL CITY (OCC) AS A
PROPORTION OF METROPOLITAN, 1900-1965^a

Year	Metropolitan Population as a Percent of U.S. Total	CC Population as a Percent of Metropolitan	OCC Population as a Percent of Metropolitan
1900	41.9	62.2	37.8
1910	45.7	64.6	35.4
1920	49.7	66.0	34.0
1930	54.3	64.6	35.4
1940	55.1	62.7	37.3
1950	59.0	58.7	41.3
1960	63.0	51.4	48.6
1963	63.4	50.0	50.0
1965	64.4	48.1	51.9

^aAdapted from U.S. Census by Alan K. Campbell and Seymour Sacks, "Metropolitan America: Governmental Patterns and Fiscal Systems" (to be published 1966).

The result of the population decentralization in metropolitan areas has been to leave the central city with a considerable concentration of Negroes and other ethnic groups who have lower incomes and less education. This result is demonstrated in Table 6. Compared to the population residing outside the central city, the city residents have lower incomes, less education, and a greater proportion of them are foreign born and Negroes.

TABLE 6

SELECTED SOCIO-ECONOMIC CHARACTERISTICS OF CENTRAL CITY AND OUTSIDE CENTRAL CITY AREAS IN COTERMINOUS UNITED STATES FOR SELECTED YEARS^a

	Year	Central City	Outside Central City
Median Family Income	1959	\$5,940	\$6,707
	1964	6,697	7,772
Percent Foreign Born	1960	9.0%	5.4%
Percent Negro	1960	16.8%	4.6%
Percent over 25 years old with 4 or more years of college	1960	8.0%	9.8%

^aAdapted from U.S. Census by Alan K. Campbell and Seymour Sacks, "Metropolitan America: Governmental Patterns and Fiscal Systems" (to be published 1966).

The impact of the socio-economic composition of the central city on public education has been considerable. A greater and greater proportion of central city school enrollments are made up of the children of the lower income ethnic families. Most of these children may be classified as "disadvantaged" students because their home environment acts as a limiting factor on school achievement.¹ The ethnic composition of central city enrollments is partially demonstrated by Table 7 which shows the proportion of the public school enrollment that is non-white in fifteen large central cities. In 1960 the non-white proportion in all of these public school systems was sizable, ranging from 16.2 percent to 77.5 percent.

The concentration of disadvantaged students in central cities has been the subject of much discussion. There is general agreement among students of this problem that the provision of education for this kind of population is both crucial and difficult. It is crucial because these are the people least equipped to enter today's labor market, and education is an important vehicle through which the

¹In a forthcoming study, Jesse Burkhead demonstrates that there is, in fact, a strong relationship between a student's home environment and his achievement in the classroom.

TABLE 7
PROPORTION OF PUBLIC SCHOOL ENROLLMENT
NON-WHITE IN FIFTEEN LARGE CITIES
1960^a

City	Percent of Enrollment Non-White 1960
New York	22.0
Chicago	39.8
Los Angeles	20.5
Philadelphia	46.7
Detroit	42.9
Baltimore	50.1
Houston	30.2
Cleveland	46.1
Washington	77.5
St. Louis	48.8
Milwaukee	16.2
San Francisco	30.5
Boston	16.4
Dallas	26.0
New Orleans	55.4

^aComputed from U.S. Bureau of the Census, U.S. Census of Population: 1950 and 1960, General Social and Economic Characteristics (Washington: U.S. Government Printing Office).

needed skills may be obtained. This kind of education is difficult to provide because specialized programs must be developed to accommodate the specialized needs which the disadvantaged have.¹

¹Discussions of these difficulties may be found in James B. Conant, Slums and Suburbs (New York: Signet Books, 1961); Patricia Cayo Sexton, Education and Income (New York: The Viking Press, 1961); and Margaret S. Gordon (ed.), Poverty in America (San Francisco: Chandler Publishing Company, 1965), pp. 129-72.

The lack of resources. With such difficult and important needs, the central city school systems do not have adequate fiscal resources to meet their expenditure requirements. In the first place, as Vernon and others have observed, the central city continues to lose middle and upper income population, as well as manufacturing, retail, and wholesale jobs, and it is this population and economic activity that should provide central cities with their taxable wealth. The process of decentralization has thus induced a relatively shrinking tax base in central cities.¹

Secondly, families with the most school age children have the lowest incomes, and this inverse relationship is stronger in the central city than in the outlying areas. The median family income of families in central cities with six or more children under eighteen years old is \$1,867 less than the income of those families with only three children. The comparable difference for outside central city areas is only \$398. (See Table 8.)

¹Raymond Vernon, The Changing Economic Function of the Central City (New York: Committee on Economic Development, 1959); Advisory Commission on Intergovernmental Relations, Metropolitan Social and Economic Disparities: Implications for Intergovernmental Relations in Central Cities and Suburbs (Washington: U.S. Government Printing Office, 1965).

TABLE 8
 MEDIAN FAMILY INCOME BY NUMBER OF SCHOOL AGE
 CHILDREN IN CENTRAL CITY AND OUTSIDE
 CENTRAL CITY AREAS, 1964^a

Number of School Age Children	Median Family Income	
	Central City	Outside Central City
3	\$7,034	\$7,922
4	6,540	7,835
5	6,235	7,347
6 or more	5,167	7,524

^aU.S. Bureau of the Census, Consumer Income: Income in 1964 of Families and Unrelated Individuals by Metropolitan-Non-Metropolitan Residence (Washington: U.S. Government Printing Office, April 25, 1966).

While resources for education in central cities are not sufficient, there is evidence that the costs of educating disadvantaged students is greater than the costs for other kinds of students. Services in schools with a concentration of slow learners, emotionally imbalanced students, and a high student turnover, among other characteristics, were found by McClure to be more costly.¹

¹William P. McClure, Some Determinants of Educational Costs in Eleven Great Cities (Chicago: Research Council of the Great Cities Program for School Improvements, March 8, 1963). (Mimeographed.)

Responsibility for non-educational services. Not only are central city school systems lacking in sufficient resources to meet their educational needs, they must also share the resources available with more extensive non-educational services than is the case in outside central city areas. The so-called "municipal overburden" problem faced by central cities is striking. The central city must spend considerably more than their outside central city areas for non-educational services. What aggravates the whole problem is the fact that these non-educational expenditures receive almost no aid from the state. Further, the nature of the aid system is such that outside central cities get nearly twice the educational aid as that received by central cities. These relationships for a sample of 37 large metropolitan areas are shown in Table 9.

Central city-outside central city disparities. The central city educational problem is thus a combination of things. The school systems of our large cities have a concentration of disadvantaged students who require high educational expenditures. To meet their needs, central

TABLE 9
FISCAL CHARACTERISTICS OF CENTRAL CITY AND
OUTSIDE CENTRAL CITY FOR THIRTY-SEVEN
METROPOLITAN AREAS, 1962^a

	Per Capita	
	Central City	Outside Central City
Total Educational Expenditures	\$ 67.96	\$122.82
Total non-Educational Expenditures	161.70	126.94
State Aid to Education	20.73	38.53

^aCalculated from: U.S. Bureau of Census, U.S. Census of Government: 1962 Compendium of Government Finances, Vol. IV, No. 4 (Washington: U.S. Government Printing Office, 1964); and U.S. Bureau of Census, U.S. Census of Governments: Compendium of City Government Finances, 1962 (Washington: U.S. Government Printing Office, 1963).

cities are faced with a relatively shrinking tax base and a municipal overburden which places even higher demands on already inadequate resources. The state aid system aggravates the situation by giving more to outside central city school systems in education aid and by not aiding the traditional municipal functions for which central cities have the greatest need. A result of all this is significant

disparity in educational expenditures between central cities and their outlying areas. The magnitude of these disparities is shown in detail for 37 of the largest central cities and their outlying areas in Table 10.

In view of the severity of the central city educational problem as reflected by these disparities, it is particularly interesting to determine the extent to which the structure of school government can alter the support for public schools in central cities. If independence or dependence can affect educational fiscal behavior, this is an important point to demonstrate. If the relative impact of school government structure is negligible, then it is important for the city to find out which factors do, in fact, determine their educational fiscal levels.

The Sample

The rationale for the metropolitan context of this study thus lies in the two factors discussed above. First is the special significance of the independence-dependence issue in metropolitan areas. The second

TABLE 10

TOTAL AND CURRENT EDUCATIONAL EXPENDITURES PER STUDENT FOR
CENTRAL CITIES AND OUTSIDE CENTRAL CITY AREAS, 1961-62^a

Cities	Total Educational Expenditures Per Student		Difference	Current Educational Expenditures Per Student		Difference
	CC	OCC		CC	OCC	
New York	603.95	869.32	-265.37	536.88	684.34	-147.36
Chicago	479.78	567.24	- 87.46	408.51	473.69	- 65.18
Los Angeles	482.62	791.92	-309.30	437.14	626.68	-189.54
Philadelphia	438.20	577.32	-139.12	397.75	492.90	- 95.15
Detroit	543.81	528.50	+ 15.31	461.67	434.10	+ 27.57
Baltimore	431.95	577.28	-145.33	366.07	421.61	- 55.54
Houston	290.62	555.25	-264.63	290.09	450.35	-160.26
Cleveland	412.70	585.21	-177.51	370.59	459.50	- 88.91
St. Louis	391.33	527.68	-136.35	386.58	423.73	- 37.15
Milwaukee	451.54	570.85	-119.31	377.96	469.38	- 91.42
San Francisco	550.50	572.37	- 21.87	466.77	519.49	- 52.72
Boston	385.46	545.80	-160.34	385.46	465.36	- 79.90
Dallas	383.36	445.60	- 62.34	301.96	325.40	- 23.44
New Orleans	278.89	341.66	- 62.77	271.87	233.05	+ 38.82
Pittsburgh	417.85	511.78	- 93.93	368.00	450.98	- 82.98
San Diego	547.65	697.98	-150.33	414.63	538.95	-124.32
Seattle	492.97	505.79	- 12.82	409.89	415.72	- 5.83
Buffalo	451.27	660.16	-208.89	447.03	561.20	-114.17
Cincinnati	411.16	745.91	-334.75	373.11	577.74	-204.63
Memphis	235.17	356.00	-120.83	227.58	245.71	- 18.13
Denver	426.67	579.97	-103.30	418.30	380.74	+ 37.56
Atlanta	276.86	352.63	- 75.77	272.52	287.80	- 15.28
Minneapolis	417.86	615.99	-198.13	414.31	442.23	- 27.92
Indianapolis	365.29	650.24	-284.95	352.87	467.92	-115.05
Kansas City	468.23	460.94	+ 7.29	409.19	350.67	+ 58.52
Columbus	331.31	398.08	- 66.77	327.40	332.06	- 4.66

TABLE 10--Continued

Cities	Total Educational Expenditures Per Student		Difference	Current Educational Expenditures Per Student		Difference
	CC	OCC		CC	OCC	
Newark	575.65	612.41	- 36.76	496.21	522.23	- 26.02
Louisville	301.46	658.04	-356.58	301.44	477.73	-176.29
Portland, O.	431.30	602.31	-171.01	421.59	480.14	- 58.55
Long Beach	460.58	779.42	-318.84	426.33	605.54	-179.26
Birmingham	239.83	247.64	- 7.81	194.43	223.84	- 79.46
Oklahoma	279.33	367.88	- 88.55	269.23	291.67	- 22.44
Rochester	602.71	732.76	-130.05	580.05	573.07	+ 6.98
Toledo	489.71	676.09	-186.38	377.71	511.85	-134.14
St. Paul	427.91	594.27	-171.36	415.51	452.88	- 37.37
Norfolk	271.17	363.30	- 92.13	265.43	288.65	- 23.22
Omaha	293.08	522.74	-229.66	282.58	394.90	-112.32
Mean	414.46	559.42	-144.96	376.33	441.99	- 65.66

^a Calculated from: U.S. Bureau of Census, U.S. Census of Government: 1962 Compendium of Government Finances, Vol. IV, No. 4 (Washington: U.S. Government Printing Office, 1964); and U.S. Bureau of Census, U.S. Census of Government: Compendium of City Government Finances, 1962 (Washington: U.S. Government Printing Office, 1963).

factor is the unique educational problems faced by central cities associated with disparities between the city and its outlying area with respect to educational expenditures. Beyond this general context, it has also been decided to limit the present enquiry to the largest central city areas. In so far as size is a factor in educational costs, this choice will at least limit comparisons to school systems in the same size category. In addition, the central city-outside central city disparities cited above are greatest in the largest metropolitan areas.¹

In view of the above considerations, only those school systems which are serving the nation's largest central cities have been selected for inclusion in the sample. According to the 1960 Census of Population, there are 43 cities whose population is 300,000 or greater. Of these, the present study has taken 37 for the analysis to follow. Of the six large cities discarded, most were eliminated either because education is provided by a large number of small school systems or because the peculiar nature of school administration (such as a single state-wide

¹Advisory Commission on Intergovernmental Relations, op. cit.

school system in Hawaii) makes comparisons with other school systems difficult. A few systems were discarded due to their failure to return a questionnaire. Thus, the remaining 37 school systems that are used in the present study all serve cities that have a population greater than 300,000 and cover an area that roughly coincides with the political boundaries of the city which they serve. The sample can best be termed a "judgment sample" and the statistical analysis must, therefore, be interpreted in a manner consistent with this fact. A listing of these city school systems with some of their social, economic, and fiscal characteristics is included in Appendix A.

The Unit of Analysis

Because the present study deals with educational decision making, the school system itself is used as the unit of analysis. In those instances where school system boundaries are not coterminous with the boundaries of the city, the fiscal and socio-economic characteristics

of the latter have been allocated to the school system. For this purpose, maps of the school system were compared to maps of the city. In those cases where the boundaries of the school system differed from those of the city, the area covered by the school system was plotted on a census tract map. Then the various socio-economic characteristics of the individual tracts were either added to or subtracted from those of the entire city depending on whether the tract was a part of the school district and not the city, or was part of the city and not the school district. In the case of split census tracts, estimates were made. If the boundary line approximately cut the tract in half, then one-half of the tract's characteristics were added to or subtracted from the city totals. A similar procedure was used when the tract was cut into quarters. No other kinds of divisions were attempted.¹

In addition to socio-economic characteristics, it was necessary to allocate to the area within the school system's boundaries certain non-educational fiscal

¹A similar procedure has been used by Charles Benson and his colleagues. See, Senate Fact Finding Committee on Revenue and Taxation, State and Local Fiscal Relationships in Public Education in California (Sacramento: Senate of the State of California, March, 1965), p. 42.

characteristics of governments overlying the system. In this case, the use of an estimating procedure was required. Generally, it was assumed that the incidence of local fiscal characteristics was distributed evenly throughout any given area according to population. Thus, population was used as an allocator to estimate the expenditures made and taxes paid within the area defined by the school system boundaries. The manner in which the data are reported determined the allocating procedure that was used.

In the 1962 U.S. Census of Governments there is a breakdown of the revenues and expenditures made by all local governments for the fiscal year ending in 1962. The breakdown of these aggregates is on a county basis. In addition, there is a separate breakdown for large city governments and school districts (independent). Finally, the National Education Association has published data for large school systems.¹

Using the above data, the following procedure was employed. The non-educational expenditures of municipalities

¹ U.S. Bureau of the Census, Compendium of Government Finances, Census of Governments, 1962, Vol. IV, No. 4 (Washington: U.S. Government Printing Office, 1963); U.S. Bureau of the Census, Compendium of City Government Finances in 1962 (Washington: U.S. Government Printing Office, 1963); National Education Association, Research Division, Selected Statistics of Large School Systems, 1961-62, Research Report, 1963-RC (Washington: National Education Association, 1963).

were first subtracted from the non-educational expenditures made by all governments in the central city county. The remainder was then allocated to the school system by multiplying it by the estimated school system population as a percentage of the county population. Next, the non-educational expenditures made by the city overlying the school system were multiplied by the estimated school system population as a proportion of the city. In the few cases where the school district boundaries encompassed an area outside of the city, the non-educational expenditures of the municipality providing services to such an area were used. These latter expenditures were allocated by taking the population that was both in the municipality and the school system as a proportion of the total population of the municipality. The final step was to add together all allocated non-educational expenditures. A similar procedure was used for other fiscal characteristics. This procedure enabled a direct comparison to be made between educational and non-educational expenditures using a common unit of analysis.

A Classification of School Governments

In Chapter II it was noted that there are varying degrees of independence or dependence that depend upon a variety of factors. The difficulty of devising an operational classification of school government is twofold. First, there are many factors involved in such a classification, and secondly, the classification system should somehow describe a continuum with independence and dependence at the two poles.

In spite of these difficulties, a classification has been devised which at least reflects a somewhat greater degree of precision than the dichotomous classification which has been used in past studies. In a sense, the James classification scheme, described in the previous chapter, has been operationalized for use in a multiple regression analysis.¹

The present classification scheme uses the positions taken by the participants in the independence versus dependence debate as a basis for placing school systems on an

¹Thomas James, J. Alan Thomas, and Harold J. Dyck, Wealth, Expenditures and Decision Making for Public Education (Stanford: Stanford University Press, 1963).

independence-dependence continuum. From the discussion of those positions in the previous chapter, it is apparent that independence advocates want control over the provision of public education to be separate from those governments or agencies which are responsible for the provision of other public services. This group also would like public education to be subject to as direct control by the local electorate as possible.

The key factor in this definition is the nature of the control over public education. There are actually three major aspects of control over public education. The first involves control over the allocation of community resources to education. In most dependent school systems, the school board has the authority to review the budget and offer proposed revisions, while a separate body has the power of final budget approval. Every group that is directly involved in the budgetary process, exercises some control over the allocation of resources to public education. A second kind of control over public education involves decisions concerning the administration and

curriculum of the school itself. Those who make such decisions have direct control over the output of the local educational system. Finally, there is control over the selection of the personnel who perform the responsibilities enumerated above. This aspect of control is held in some instances by the electorate who elect officials to represent them. In other instances, school officials are appointed by other public officials. From this discussion of the nature of control over public education, ten control functions have been enumerated. These are: budget approval authority, selection of budget approvers, budget review authority, selection of budget reviewers, curriculum decision power, selection of curriculum decision makers, personnel decision power, selection of personnel decision makers, taxing power, selection of taxers.

These ten control functions can be held by six different organizations or groups. They are: the electorate, the school board, a municipality, a county, multi-function special districts, and the state or agencies

thereof. The classification of school systems must recognize that the various types of control outlined above can be held by the six groups in various combinations. Using the position of the independence advocates as a criterion, the six groups have been arranged ordinarily starting with those groups that are closest to the people and not directly responsible for performing other public functions. Only two of these, the electorate and the school board are directly free from such responsibility. The remaining four have thus been arranged according to their closeness to the local constituency. On this basis, the following order for the groups has been devised:

1. Electorate
2. School Board
3. Municipality
4. County
5. Multifunction Special Districts
6. The State.

The actual classification of independence and dependence has been based upon the distribution of control

(as defined above) over education among the six groups. The order of the groups constitutes the continuum. The extreme dependence prototype is where the state reviews and approves the local school budget, makes all decisions on curriculum and administration and appoints all school officials. The extreme independence case is where the electorate performs these same responsibilities. Actually, various aspects of school system control are held by a variety of groups. The position on the continuum of any one school system is determined by the ordinal position, as outlined above, of the group which holds the majority of the control functions. In cases where functions are evenly distributed among two or more groups, the groups with budget approval authority are determinate.

It should be further pointed out here that a deliberate effort has been made to keep the classification within the context of the continuing independence versus dependence debate. For this reason, such factors as "state mandated expenditures,"¹ state aid to education and state imposed tax limitations as elements of dependence

¹James et al., op. cit., Chap. II.

on the state have not been included. These will be treated separately in the analysis even though, as will be demonstrated, they are actually important elements of school governmental structure.

A questionnaire was sent to the school systems in the sample requesting the information necessary to form the classification outlined above. Of the 37 school systems in the sample, there were 21 different combinations of control functions held by the six types of groups outlined above. These different combinations were then ordered on the continuum depending on which group held the most control. To assist in this process, the various types of control were given weights according to the relative importance of each control function to the operation of the school system. The main criterion utilized for the weighting was the degree of presumed impact of the various functions on educational fiscal levels. By this criterion, budget approval authority and taxing powers were weighted by a factor of three, budget review power two, personnel decisions, curriculum

decisions and the powers to select the decision makers were each weighted one. Next, the six groups that could hold these powers within each school system were given a score which was derived by adding up the weights of the control functions held by each group. As explained above, the group with the highest score determined a given school system's position on the continuum. The 21 different combinations of powers among the six groups could thus be broken down into six ordered positions on the independence-dependence continuum. In order to make the classification workable in terms of a multiple regression analysis, the positions on this continuum were described as a series of dummy variables. A value of one was assigned to the most independent systems, while the next were assigned a zero value. A second variable was added for school systems in the number two spot on the continuum. These school systems were assigned a value of one and the rest were zero. This procedure was followed so that for a six-part continuum, there were five separate variables.

It was discovered, however, that these five variables, added to the other variables which were found to be important in explaining fiscal variations, made a much too complicated statistical model. Further, with only 37 observations, there were only a few school systems in several of the six positions on the continuum. For this reason, these six places were paired leaving only three categories.

The actual breakdown of the sample according to the three-part classification is shown in Table 11. The category marked "independent" includes those systems where the school board has all of the powers enumerated above, and is chosen by the electorate. Among the "dependent" school systems there are different combinations, but basically, budget approval and taxing power are held either by the city, county or state. The only exceptions are Memphis, where the taxing power is shared between the school board and the county; Indianapolis, where the school board has taxing power but the state approves the budget; and New Orleans, where the state has all the

TABLE 11
CLASSIFICATION OF CITY SCHOOL SYSTEMS ACCORDING
TO THEIR RELATIVE DEGREE OF INDEPENDENCE
OR DEPENDENCE, 1962

Independent	Middle	Dependent
Los Angeles	Chicago	New York
Detroit	Philadelphia	Baltimore
St. Louis	Houston	Boston
Milwaukee	Cleveland	New Orleans
Dallas	San Francisco	Buffalo
Seattle	Pittsburgh	Memphis
Denver	San Diego	Indianapolis
Minneapolis	Cincinnati	Newark
Kansas City	Atlanta	Rochester
Portland, O.	Columbus	St. Paul
Omaha	Louisville	Norfolk
	Long Beach	
	Birmingham	
	Oklahoma City	
	Toledo	

powers except taxation, which is held by the school board. The other school systems which have been placed in the middle category account for all of the other combinations which, according to the scores, fall in between the two extremes. The distribution of control functions in schools falling in the middle category includes a variety of arrangements. Typically, the school board in these school

systems operates a school district which is in most ways separate from other governments and which has the authority to make independent decisions. Some important control functions, however, are held by a municipality or county. In Chicago, for example, the school board performs all functions except taxation which is in the hands of the city government, and the selection of the school board members, which is also done by the city.

Statistical Methods

The basic approach of the statistical analysis is cross sectional. That is, variations in educational fiscal characteristics that occur from place to place at a point in time (1961-62) will be analyzed. As suggested earlier, the most appropriate statistical technique for the purposes of the present study is one that can explain such variations in terms of several independent variables. Two techniques have been utilized in this study: simple correlation and multiple regression analysis.

The simple correlations are used to gain some

preliminary insight into the interrelationships between those variables that have a bearing on the issues raised by the present study. While simple correlation provides no indication of causality, it does determine the extent and direction of linear association between two variables. The coefficient of simple correlation is, in fact, a measure of covariance. This measure is limited, however, because a simple correlation may reflect the relationships between more than the two variables being used. Further, the coefficient provides no information about the amount of change in one variable that may be associated with a given amount of change in the other.

In order to overcome these limitations, least squares multiple regression analysis has been utilized. The multiple regression model is appropriate for this study because it makes it possible to look at the extent to which the independence or dependence of the school systems is associated with the variations in educational fiscal characteristics, with the effects of other variables on these characteristics held constant. The multiple

regression equation describes the average relationship between the dependent variable and a series of independent variables in terms of a regression surface or "line." When the regression analysis is applied to only two variables the line of regression is described by the equation $Y = a + bX$ which describes the amount of change in the dependent variable that is associated with a given amount of change in the independent variable. In the case of multiple regression, the same principle applies except that the regression "line" has two or more dimensions. The multiple regression equation is expressed as $X_1 = a + b_2X_2 + b_3X_3 + \dots + b_nX_n$, where a is a constant describing the function's intercept; b is the net regression coefficient, which will be explained below; and X is the value of the variable itself. The net regression coefficient is a constant that measures the "weight" of a given independent variable (net of the effects of the other independent variables in the equation) when it is used to estimate the dependent variable (X_1). The value of the coefficient indicates the amount of change

in the dependent variable that may be associated with a one-unit change in the independent variable. The sign of the regression coefficient tells whether this change is up or down. In the present study the statistical significance of the regression coefficient is determined by the use of student's t . This measure is the ratio of the coefficient to its own unbiased standard error.

In order to compare the relative power of the regression coefficients in a given equation, the net regression coefficient is not adequate because the independent variables are expressed in different units of measurement. For this reason the beta coefficient has been utilized. The betas simply express the regression coefficients in terms of their standard deviations, thus introducing a single unit of measurement into the equations, and allowing a comparison to be made of the relative power of the independent variables in explaining the variation in the dependent variable.

A third coefficient used in this study is the

partial correlation. This measure is comparable to the simple correlation discussed above. The difference is that the partial correlation expresses the association between the dependent variable and a given independent variable in the equation with the effects of the other independent variables held constant.

Another useful measure is the coefficient of elasticity. This coefficient measures the percentage change in the dependent variable that may be associated with a one percent change in a given independent variable. This coefficient is also a measure that is net of the effects of the independent variables on one another. The elasticity has been measured at the point of means of the independent and dependent variables in question. In a sense, the coefficient of elasticity is simply the regression coefficient expressed in relative terms.

Measuring the explanatory power of the entire multiple regression equation is the coefficient of multiple correlation R and its square, the coefficient of multiple determination. R indicates the average

degree of association of all the independent variables taken together with the dependent variable. The coefficient of multiple determination, R^2 , is the percentage of variation in the dependent variable that can be "explained" by the combined effects of the independent variables.

By using these coefficients, the methodology of many of the studies discussed in Chapter II can be improved. The methods described above, however, can be best applied with the aid of some theoretical expectations concerning the variables to be analyzed. Otherwise it would be difficult to know what variables to include in the equation and there would be little basis for insight into the direction of causality. The development of an analytical framework based on theoretical considerations that can contribute to the selection of the variables and hypotheses concerning their behavior is the subject of the following chapter.

CHAPTER IV
A MODEL OF PUBLIC FISCAL DECISIONS
AT THE LOCAL LEVEL

Introduction

The purpose of this chapter is to develop a theoretical statement concerning the nature of fiscal decision making for public elementary and secondary school systems. From this statement, an analytical framework is devised that can serve as a basis for the selection of, and some hypotheses about, the variables to be used in the statistical analysis. Two things should be kept in mind while reading this chapter. First, the reason for developing a broad analytical framework is to ascertain which variables should be held constant while looking at independence-dependence, and also to learn what other variables are important in explaining educational fiscal behavior. Second, while much of the theoretical development in this chapter has broad

applicability, at this stage it is only meant to be interpreted in terms of large central cities.

Toward a Theory of Educational Expenditures

In the development of a theory of educational expenditures there are two possible approaches. One may be called a normative approach. Applied to the field of public expenditures, a normative theory attempts to explain how levels of public expenditures ought to be determined.¹ Such a theory is supposed to provide guidelines for an optimal allocation of resources between public and private sectors and within the public sector as well. Theoretical formulations of this sort come out of the field of welfare economics and are generally concerned with making certain that public resource allocation approaches some welfare maximization principle. An alternative theoretical approach could be called a positive-explanatory theory. Such a theory is not so concerned with what ought to be, but rather attempts to describe and explain what is. The distinction between the two approaches is not clear-cut. There is in practice

¹This is generally the approach of Samuelson. Paul Samuelson, "The Pure Theory of Public Expenditure," Review of Economics and Statistics, XXXVI (November, 1954), 287-89. Also see Jerry Miner, Social and Economic Factors in Spending for Public Education (Syracuse: Syracuse University Press, 1963).

some overlapping, and the distinction itself ends up being largely a matter of emphasis. The emphasis of the present theoretical statement is on the positive explanatory side.

In order to begin the development of a positive theory which explains educational fiscal decisions, it is well to start at the broadest level and distinguish between public and private expenditures in general. Musgrave¹ has suggested that public budgets have three broad functions: the distribution of income in a manner consistent with the values of society, the stabilization of the economy, and finally the allocation of resources between the private and public sectors of the economy and also among the several functional areas within the public sector. The distribution and stabilization functions of the public budget are largely the responsibility of the Federal Government. Since the concern of the present study is with the behavior of local governments, only the resource allocation function of the public budget will be considered. In order to fully understand the process of resource allocation to, and within, the public sector, it is necessary

¹Richard A. Musgrave, The Theory of Public Finance (New York: McGraw-Hill, 1959).

to recognize the differences between the public and private sectors both with respect to the nature of the expenditures and also the nature of expenditure decisions.

Public expenditures differ from their private counterparts in a number of ways. Perhaps the most important difference lies in what Musgrave has called the "exclusion principle."¹ In the private sector, given the assumption that goods are scarce, an individual decision to make a purchase of a commodity will exclude someone else from its use. This fact is what makes the market mechanism work. Individuals reveal their preferences for various commodities by bidding through the price mechanism for a commodity's exclusive use. The scarce goods go to the highest bidder. This does not work in the case of public goods because the exclusion principle does not operate. Once a community provides a public good, such as education, the benefits from that good cannot be confined to particular individuals. Even if the government should run the schools privately by charging tuition, the benefits of having educated people in the community would not be

¹Ibid., pp. 9, 86.

confined to the families that had paid their tuition, but would spill over to other members of the community. If the exclusion principle does not apply and the purchase of a public good does not exclude one's neighbors from its benefits, there is no reason for anyone to reveal his preference by engaging in competitive bidding as they do in the case of private goods. For this reason, the government steps in and charges everyone for those goods that a majority of the community desires, whether individual members of the community want them or not. The goods are paid for mainly by taxes, and the preferences of the community are expressed only indirectly, through the ballot box.

Thus, public spending involves not only an allocation of resources but an allocation of values as well. When elected officials make a decision to spend public monies, they do so on the assumption that this decision reflects the values of the constituency which they serve. The decision, once made, is binding, and all individuals in the community in question must, under penalty of law,

pay with funds which might otherwise be saved or spent in the private sector of the economy. In a sense, this is what David Easton meant when he defined the scope of political science as "the authoritative allocation of values in a society."¹ In order to understand public expenditures and how they are determined, therefore, it is necessary to develop an understanding of political behavior in the context of budgetary decision making. Political decisions about expenditures may be made for a variety of reasons and cannot be easily explained. It is possible, however, to isolate certain factors which appear to be important and to have a somewhat uniform application in different situations. In order to uncover such uniformities it is necessary to begin by asking: What broad categories of potential influences could be said to account for variations in the level of support for certain public goods and services? In answering this question, it is useful to put the categories into a framework that is appropriate for describing the political process. A rough approximation of Easton's framework will be used for

¹David Easton, The Political System (New York: Knopf, 1953). Easton's analysis is broader than the fiscal discussion presented here.

this purpose.¹

Stated in very simple terms, Easton suggests that political decisions can best be understood by using systems analysis. A given political decision can be thought of as an output of a political system which is the result of a complex interaction between the system itself and the demands made upon it. Such demands, tempered by the degree of support for the system as it exists, put stress on the system. As a result of these stresses, demands are converted into outputs. The nature of the outputs is determined not only by the demands and support level but by the structure of the system itself. The Easton framework contains a dynamic element called feedback. The idea here is that the outputs of the system in (t_1) have an impact on demands and support and thus indirectly become system inputs in (t_2).

This kind of model is especially appropriate for an

analysis of public fiscal decisions. An alternative type of model for such an analysis takes the supply-demand framework that has been used to explain private expenditures and

¹Ibid. Also see two other books by David Easton, A Framework for Political Analysis (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1965); and A Systems Analysis of Political Life (New York: John Wiley & Sons, Inc., 1965).

adapts it to the public sector.¹ As discussed in the previous chapter, there are some problems in the reasoning that would lead to the adoption of such a model. In addition, there are some difficult conceptual problems with this type of model when used to explain the public sector. The major conceptual problem with using this private sector model in the public sector is that those variables which reflect the demand for public goods and services may also be viewed as supply elements. In a study of the private spending behavior of households, only the demand elements need be considered because the conditions that affect the unit cost of a private sector commodity confront only producers and have no relationship to the characteristics of households. In the public sector, however, it is the government rather than the household whose behavior is being analyzed, and the government both produces and consumes many of its commodities.² This is especially true of education. The variables that determine the levels of support for education are often double-edged, reflecting both supply and demand, because the conditions

¹Miner, op. cit.

²Ibid., p. 74.

confronting the local government which may affect education's unit cost may also measure the demand for education. Income, for example, can be conceptualized as a measure of the ability to pay for education, and, in this sense, be a demand element. At the same time, however, in order to obtain the higher level of education demanded in a high income community, the local government will have to pay teachers higher salaries, raising education's unit cost. Thus, in this sense, income is a supply factor.

Another reason why the private sector supply-demand model is inappropriate for explaining expenditures for public education (and public expenditures in general) is that there are other determinants of such expenditures that just do not fit the supply-demand mold. Such variables actually reflect differences in the political decision making process which, in the terminology of the Easton model, may be called the political system.

For these reasons, the Easton-type model is conceptually clearer and hence more useful for thinking about fiscal decisions concerned with public education than one

which attempts to use the supply-demand framework. A model of the former type can be called a political decision-making model.¹ In the present study, an adaptation of the Easton framework is used which views expenditures and revenues for public elementary and secondary education as the outputs of a local governmental system that come about as a result of an interaction between the system itself and the demands made upon it.

A diagram of this analytical framework in a generalized form is presented in Figure 1. The diagram shows

¹Aside from the works of Easton there have been a number of other political decision making models. See, for example, Wallace S. Sayre and Herbert Kaufman, Governing New York City: Politics in the Metropolis (New York: W. W. Norton & Company, Inc., 1965); John C. Wahlke et al., The Legislative System: Explorations in Legislative Behavior (New York: John Wiley & Sons, 1962); and Gabriel A. Almond and James S. Coleman (eds.), The Politics of Developing Areas (Princeton: Princeton University Press, 1960). A preference and argument for the use of a political model in explaining public sector expenditure behavior is presented in: Anthony Downs, An Economic Theory of Democracy (New York: Harper & Row, 1957). A more recent argument using expenditures for public education as a focus, suggests that "political factors" really explain such expenditures and that economists should discard the notion that a pricing mechanism is the device which allocates resources into and within the public sector. Otto A. Davis, "Empirical Evidence of Political Influence Upon the Expenditure Policies of Public Schools," The Public Economy of Urban Communities, ed. Julius Margolis (Washington: Resources for the Future, 1965), pp. 92-111.

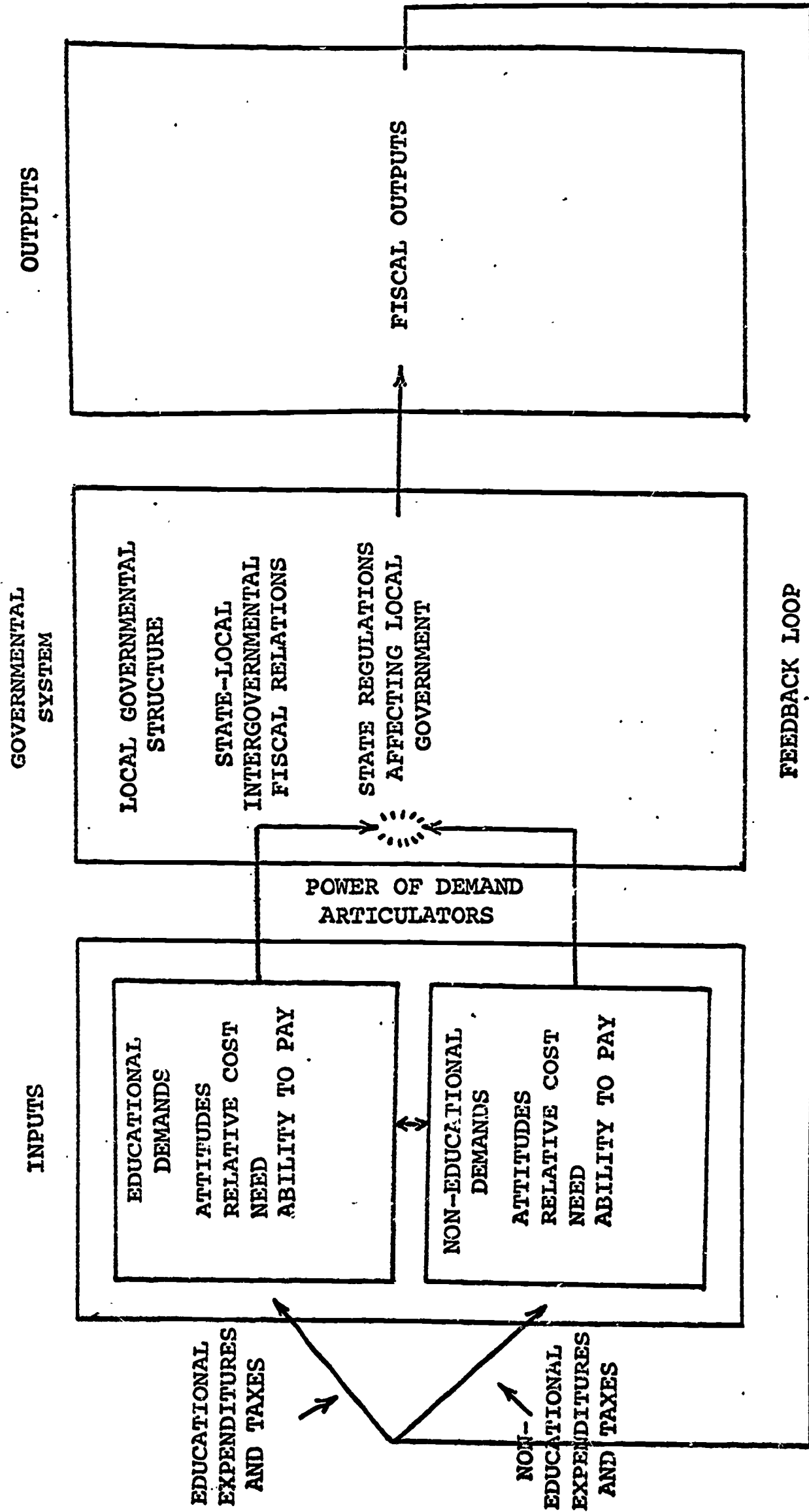


Fig. 1. A Model of Fiscal Outputs.

inputs in the form of demands on the local governmental system feeding into the system itself. The fiscal outputs of the model feed back into the input side in the following time period. There are several things about the nature of this model which should be understood.

First, while it is presented in a general form, it is intended to be used to explain fiscal decisions made by school systems serving the central city portions of metropolitan areas as well as those decisions made by the other governments which overlies these systems.

Second, although the feedback element offers a dynamic element, the model is generally static in nature. This fact is fundamental to the cross sectional approach and to the interpretation of the results of this study. In the model, variations in the level of school support are being observed among different school systems at a point in time and then differences in socio-economic characteristics of the school systems at the same point in time are used to "explain" the variations which were observed. This kind of model can lend empirical content

to hypotheses dealing with the reasons for variations in school support among school systems during a particular year. It does not explain changes in school support over a period of time. For this purpose a dynamic "time series" analysis and model is required. What is assumed in this static model is that political decision makers in all of the school systems in the sample are influenced in a roughly uniform manner, and that certain characteristics of the community and of the governmental system will lead to predictable levels of fiscal outputs. Thus, the generalized model depicted in the diagram attempts to show the kinds of characteristics that are involved, and how they interact with one another to produce certain levels of fiscal outputs.

Starting with the input side of the model, it is suggested that the demands made on the system for local public services depend to some extent upon the existing level of such services. This is depicted by the feedback arrows pointing toward two types of fiscal demands.

Whether the existing levels of service lead to demands

for increases, decreases, or the status quo, depends upon the particular mix of factors which can affect the nature of the demands being made.¹

In order to understand exactly how these factors affect the demands it is important to note that the demands may vary depending upon the kind of service involved. On the diagram, this fact is shown by a division of the inputs into educational and non-educational demands. Although this dichotomous division oversimplifies the situation to some extent, it can be justified on several grounds. In the first place, a major portion of local public expenditures are accounted for by education. Secondly, most non-educational local expenditures made in the geographic area bounded by the school system are made by the city government. Finally, it could be argued that education is viewed as a different kind of public service by the populace and that this is the reason for the large number of independent school districts that exist and the reason the number of these kinds of school districts is growing. In light of these considerations, therefore,

¹The term "demand" is used here in a political sense. Thus, the more usual economic definition of the word is not applicable.

the lumping together of the non-educational expenditures does not seem to distort the local decision making process to any great extent.

In the diagram, the educational and non-educational demands on the input side are linked together by a double arrow. This arrow represents the hypothesis made earlier that these two kinds of expenditures may compete with one another for the resources which the populace is willing to allocate to the public sector.

The nature of the demands themselves are affected by four separate factors. The variables which represent these factors may be different depending on the kind of service involved. The factors as noted on the diagram are: attitudes, relative cost, ability to pay, and need. A positive attitude toward education among the majority of voters in the community, for example, may be expected to lead to demands for high levels of expenditure. Demands resulting from a set of attitudes toward education may be tempered by education's relative cost and the ability of the residents of a community to pay. Finally, the need

for education takes cognizance of the fact that communities may vary in the proportion of the population that wants to attend public schools.

Connecting the demands to the system are two arrows which represent the channels through which the demands are communicated to the system. The labels on these arrows, "power of the demand articulators," gives recognition to the fact that all members of the community are not graced with an equal quantity of political resources. Thus, it is suggested that the relative political power of those who articulate a given set of demands and the extent to which these demand articulators choose to utilize the political resources at their disposal will have an effect on the stress which these demands can place on the system.¹

The transformation of demands into outputs is the task of the political decision makers who must operate within the confines of their governmental system. It is assumed in this model that these decision makers are motivated by their desire to hold onto their office. Thus, the demands of their constituents will be attended to as

¹The term "demand articulators" was suggested by my colleague, Philip Meranto.

much as possible. Decision makers, however, are faced with constraints other than the demands of their constituents. Variations in the decision making process which reflect the nature of the governmental system can also affect the manner in which demands are transformed into fiscal outputs.

There are probably many things about the local system that can have an impact on the fiscal support for local public goods and services. In order to avoid unfathomable complexity, however, the present model has hypothesized that three factors are the most significant: local governmental structure, the nature of intergovernmental fiscal relations, and various state regulations that may act as a constraint on local governmental fiscal activity. The resolution of the competing resource demands between education and other services takes place within the system. In a sense, the relative strength of these two kinds of demands are themselves an element of the governmental system. This idea is depicted on the diagram by bringing the two input arrows together in the box

representing the system.

Perhaps the most distinctive aspect of the governmental system in metropolitan areas is the multiplicity and overlapping of jurisdictions. Exactly how this complexity affects the level of local fiscal activity has never been determined. As noted in the preceding chapter, however, complexity has been singled out at one time or another as being responsible for many of our urban ills. Earlier it was suggested that one element of this complexity--the independence of the school system--probably has very little effect on educational fiscal levels, but may influence the relationship between educational and non-educational expenditures. What this hypothesis suggests is that when demands are made for different kinds of expenditures to different governments, a keener competition for available resources may exist because each government is able to try to maximize its share of the resources without considering the needs of the others.

The second factor which has been singled out to demonstrate the importance of the local governmental system

is the nature of intergovernmental fiscal relations. The major expression of these relationships is the grants-in-aid which federal and state governments are making to local governments. The impact of these grants on the fiscal outputs of the local governmental system have been shown to be important.¹ The importance of the grants lies not only in the addition they make to local revenues but also in the provisions of many grants-in-aid that they be matched by local funds. Further, a grant could conceivably have a multiplier effect by starting a level of spending which gives the people certain stakes in their government which could require even more spending. Grants for new educational facilities, for example, could generate greater spending through increased maintenance costs and additional salaries. In this manner, the nature of intergovernmental fiscal relations can lead to local decisions that may influence the local fiscal outputs quite apart from the demands of the local constituency.

The same can be said for certain state imposed regulations. Statutory limitations on the power to tax,

¹Seymour Sacks and Robert Harris, "The Determinants of State and Local Government Expenditures and Intergovernmental Flows of Funds," National Tax Journal, XVII (March, 1964), 75-85.

salary level requirements, school curriculum regulations, and the other state mandates affect the leeway that local decision makers have in making their decisions. The existence of such regulations results in a certain amount of local expenditures that are the direct result of state requirements. James has called these levels "state mandated expenditures."¹

Another kind of requirement that may have a fiscal impact at the local level is the assignment of responsibility for non-educational functions. In some states, for example, welfare is largely a local function, while in others the state carries most of the load. These requirements can have an impact similar to that of grants-in-aid. The assignment of a function to the local level may give the population reason to spend more by creating a more substantial ongoing local government.

¹H. Thomas James, J. Alan Thomas, and Harold J. Dyck, Wealth, Expenditures and Decision Making for Education (Stanford: Stanford University Press, 1963). To actually measure these levels, presents some very real conceptual problems as well as problems of data availability. On the basis of some estimates made by James, however, Renshaw has used mandated expenditures as a variable in a regression equation. Edward F. Renshaw, "Note on the Expenditure Effect of State Aid to Education," Journal of Political Economy (April, 1960), pp. 170-73.

The Analytical Framework and Hypotheses about
the Determinants of Local Expenditures

The above discussion has described and presented the logic behind the analytical framework. The next task is to actually measure the various factors described in the framework and to test the above hypotheses using multiple regression analysis. For this purpose, the outputs of the model are considered dependent variables. The inputs and the governmental system are looked upon as independent variables.

In other words, through multiple regression analysis, variations in 1962 fiscal outputs among the 37 school systems in the sample will be "explained" by variables which represent the interaction between the governmental system and the fiscal demands made upon it. All of the elements in this model could not be quantified with the rigor required for the regression analysis. For this reason the explanatory power of the regression model is not expected to be exceptionally high. As the full model is discussed below, the gaps resulting from measurement problems will be noted and

some hypotheses will be made concerning how these gaps might affect the actual model if the measurement difficulties could be overcome. Further, it should be noted that many alternative measures of the various elements in the analytical framework could have been used. Those actually chosen were those which worked the best in a number of preliminary simple correlation and multiple regression analyses which were made during the course of the study. Only the hypotheses about the variables actually used are included below.

Fiscal Outputs: The Dependent Variables

Four dependent variables have been selected for both the simple correlation and the multiple regression analyses. Each of these variables is designed to measure a particular aspect of the questions which were posed in Chapter I. In the terms of the model, they represent the fiscal outputs of the governmental system. The first of these variables is current educational expenditures per student (X_1). The variations in this expenditure measure

are meant to depict the nature of what was referred to in Chapter I as the educational issue or the struggle to provide the large city inhabitants with a level of educational service that meets their requirements. Current expenditures are used instead of total because the educational issue is concerned with those aspects of school expenditures which are recurring rather than the more erratic capital expenditures which may be based on an entirely different set of decision rationale. The expenditures are divided by the number of students because it is felt that the level of educational services is best measured by the amount the system is spending on each individual pupil. The number of students is defined as the enrollment in October 1961 which corresponds to the 1962 fiscal year in most school systems. This particular measure of the number of students is chosen because it offers the most comparability of any of the student measures available.

The other dependent variables represent the various aspects of the fiscal issue. Total educational

expenditures per capita (X_2) are used to measure the total amount of effort being made for education. In order to measure the tax burden which this effort requires, a proxy variable is employed because in dependent school systems it is not always possible to determine how much of the taxes paid to the municipality are used for education. Thus, intergovernmental revenues for education are subtracted from total educational expenditures per capita. The remainder is called "total non-aided educational expenditures per capita" (X_3), and is designated as a proxy for the local taxes used to finance public education. A further aspect of the fiscal issue concerns the allocation of resources between educational and non-educational functions. The variable used to measure allocation is current educational expenditures as a proportion of the current expenditures made by all local governments in the area serviced by the school system (X_4). Current expenditures are used because it is the recurring resource allocation decisions that are of interest.

The Independent Variables for the
Simple Correlation Analysis

In the simple correlation analysis, measures have been applied to the analytical framework discussed above. by placing the independent variables into eight categories, which are shown in Table 12. The present discussion of the independent variables will serve only to state expectations concerning the direction of their relationship to the dependent variables and also to show how these variables fit into the analytical framework. These expectations are based on previous studies, logic, and a priori considerations. The hypotheses are shown in Table 12 and a discussion of them is found below.

Inputs--attitudes toward education. One of the input factors is the attitudes citizens hold concerning the value of education. Actually, this one factor alone could be the subject of several lengthy studies. It is not the intention of this writer to attempt to measure attitudes directly. Instead, certain community characteristics which are intended to reflect the extent to

TABLE 12
HYPOTHESES CONCERNING SIMPLE CORRELATIONS

		Central City			
		X ₁	X ₂	X ₃	X ₄
		Current Educational Expenditures Per Student 1962	Total Educational Expenditures Per Capita 1962	Total Non-Aided Educational Expenditures Per Capita 1962	Current Educational Expenditures as a Percent of All Local Expenditures 1962
Attitudes					
X ₅	Median Family Income (1959)	+	+	+	+
X _{5.1}	Per Capita Income (1959)	+	+	+	+
X ₆	Percent 12+ years of Education (1960)	+	+	+	+
X ₇	Percent Owner Occupied (1960)	+	+	+	+
X ₈	Mobility Index (1960)	-	-	-	0
X ₉	Dropout Rate (1963)	-	-	-	-
X ₁₀	Current Educational Expenditures Per Student OCC (1962)	+	+	+	+
X _{10.1}	Current Educational Expenditures Per Capita OCC (1962)	+	+	+	+
X ₁₁	Percent Negro (1960)	0	0	0	0
X ₁₂	Percent Irish (1960)	0	0	0	0
X ₁₃	Percent Italian (1960)	0	0	0	0
X ₁₄	Percent Pole-Czech. (1960)	0	0	0	0

TABLE 12--Continued

	Central City			
	X ₁	X ₂	X ₃	X ₄
	Current Educational Expenditures Per Student 1962	Total Educational Expenditures Per Capita 1962	Total Non-Aided Educational Expenditures Per Capita 1962	Current Educational Expenditures as a Percent of All Local Expenditures 1962
<u>Relative Cost</u>				
X ₁₅ Total Educational Expenditures Per Capita OCC (1962)	+	+	+	+
X ₁₆ Beginning Teachers Salary (1964)	+	+	+	+
X ₁₇ Total Enrollment (1961)	+	+	+	+
<u>Need</u>				
X ₁₈ Enrollment (Public) as Percent of Population (1961-62)	-	+	+	+
X ₁₉ Percent Population 5-18 years (1960)	-	+	+	+
X ₂₀ Public School, Enrollment as Percent of Total Enrollment (1962)	-	+	+	+
<u>Ability to Pay</u>				
X ₂₁ Percent Non-Residential Property Value (1962)	+	+	+	0
X ₂₂ Educational Taxes (Proxy) paid by Non-Residential Property (1962)	+	+	+	0
<u>Non-Educational Demands</u>				
X ₂₃ Current Non-Educational Expenditures Per Capita (1962)	-	-	-	-

TABLE 12--Continued

	Central City			
	X ₁	X ₂	X ₃	X ₄
	Current Educational Expenditures Per Student 1962	Total Educational Expenditures Per Capita 1962	Total Non-Aided Educational Expenditures Per Capita 1962	Current Educational Expenditures as a Percent of All Local Expenditures 1962
<u>Governmental Structure</u>				
X ₂₄ Independent Systems = 1, Rest = 0 (1962)	+	+	+	+
X ₂₅ Middle Systems = 1, Rest = 0 (1962)	0	0	0	0
X ₂₆ Dependent Systems = 1, Rest = 0 (1962)	-	-	-	-
<u>Intergovernmental Fiscal Relations</u>				
X ₂₇ Educational State Aid per Student (1962)	+	+	+	+
X ₂₈ Educational State Aid per Capita (1962)	+	+	+	+
<u>Feedback</u>				
X ₂₉ Educational Capital Expenditures per Student (1957)	+	+	+	+
X ₃₀ Median Family Income (1949)	+	+	+	+

which a given community places a relatively high or low value on the educational commodity have been selected.

The first of these characteristics is median family and per capita income (X_5). It is expected here that families with higher incomes place a higher value on education than those in the lower income brackets. This expectation is not inconsistent with other studies.¹ Thus, the hypothesis is that there is a positive relationship between income and each of the dependent variables.

The proportion of the population with twelve or more years of education (X_6), is a measure of the educational level in the community. It is assumed that there is a positive relationship between educational attainment and the value placed on education. Thus, a positive correlation between this variable and each of the dependent variables is anticipated.

The proportion of the community owning their own homes (X_7), is expected to be positively related to the dependent variables. Homeowners are in a paradoxical position. In central cities they generally have higher

¹See, for example, Patricia Sexton, Education and Income: Inequalities in Our Public Schools (New York: The Viking Press, 1961). See especially, pp. 227-29.

incomes than non-homeowners and also have more children in school. At the same time, they must pay directly for educational expenditures through the property tax. Past studies have shown that homeownership has a depressing effect on public expenditures in general, but have a positive effect on educational expenditures.¹ This means that the high value placed on education by homeowners overcomes the knowledge that they must pay directly through higher taxes for such expenditures. Thus, a positive relationship between the percent of owner-occupied housing units and the dependent variables is expected. The relationship should be particularly strong with current educational expenditures as a proportion of the total.

The mobility index used here is the percentage of persons over five years old who were living outside the central city in 1960 but who had lived in that city in 1955 (X_8). Where this ratio is high, it is an indication that the city does not have a stable population and would not be willing to offer as much support for education as less mobile cities. Thus, the hypothesis is that a

¹Woo Sik Kee, "City Expenditures and Metropolitan Areas: Analysis of Intergovernmental Fiscal Relations" (unpublished Ph.D. dissertation, Syracuse University, 1964).

negative relationship exists between mobility and all dependent variables except the educational proportion, where high mobility would not be expected to have any effect at all.

In communities where a high value is placed on education, the dropout rate (X_9) is expected to be relatively low. For this reason the dropout rate ought to bear an inverse relationship to all four dependent variables.

The level of educational services provided by the school systems operating outside of the central city but within a given metropolis is measured by current educational expenditures per student and per capita outside the central city (X_{10} , $X_{10.1}$). The hypothesis is that this level will bear a strong positive relationship to all dependent variables. The thinking behind this expectation is that the presence of these systems (which on the average spend more than the central city school systems) has a "demonstration effect" on the central city school systems who follow the example of their neighbors and attempt to keep their

own expenditures in line with those around them.¹

The remainder of the attitudinal variables (X_{12} , X_{13} , X_{14}), are measures of the ethnic composition of the school systems in the sample. Many studies of ethnicity suggest that some ethnic groups have a uniform set of attitudes which they hold as a group.² This literature is not of much help, however, in forming meaningful hypotheses about the relationship between the dependent variables and the relative concentration of these groups. A further difficulty here is that there is a regional distribution of these groups which is apt to bias any relationships found. The highest numbers of Negroes relative to total population are in Southern cities which also have lower

¹The so-called "demonstration effect" in the private sector has been put forth by Dusenberry who argues that private consumption is partially a function of the consumption patterns of one's peers. In the present study it is suggested that a similar phenomenon occurs with respect to public spending. See James Dusenberry, Income, Saving, and the Theory of Consumer Behavior (Cambridge: Harvard University Press, 1949).

²For example, see Nathan Glazer and Daniel P. Moynihan, Beyond the Melting Pot (Cambridge: Massachusetts Institute of Technology Press, 1964); Herbert Gans, The Urban Villagers (New York: The Free Press, Inc., 1963);

Edward C. Banfield and James Q. Wilson, "Voting Behavior on Municipal Public Expenditures: A Study in Rationality and Self-Interest," The Public Economy of Urban Communities, ed. Julius Margolis (Washington: Resources for the Future, Inc., 1965), pp. 74-91.

educational expenditures. In the case of other ethnic groups used in this analysis, the highest concentrations are in the Northeast with very few in the West and Southwest. Since the sample is only 37 school systems, statistical relationships are apt to reflect only regional variations in school support and not the effect of the ethnic groups per se.

Inputs--the relative cost of education. The second input factor is the relative cost of providing education. This is not a qualitative factor as is the case with attitudes, but rather represents a parameter within which educational fiscal decisions must operate. Since costs are a dynamic phenomenon that can change from year to year, they are viewed here as an input.

The total educational expenditures of outside central city school systems per capita (X_{15}) is quite similar to the outside central city variable discussed above. This duplication is made to stress another aspect of outside central city educational fiscal behavior which

has relevance to the central city school system. The hypothesis is that outside central city school expenditures not only have a "demonstration effect" but they are also a measure of the nature of the labor market. Central city schools must compete with their neighbors for teachers and other personnel, so that the salaries for school personnel inside and outside of the central city school system are highly related. For this reason, the educational expenditures made in the outlying school systems should show a positive relationship to all of the dependent variables.

Teachers' salaries (X_{16}), are a second cost variable. A positive relationship to all of the dependent variables is expected. This hypothesis is consistent with the well-known fact that salaries are a basic component of the cost of education.¹

One final cost variable, total enrollment (X_{17}), is also expected to bear a positive relationship to all dependent variables. If economies of scale are operative, one would expect the correlation to be negative. But the

¹William P. McClure, The Structure of Educational Costs in the Great Cities (Chicago: Research Council of the Great Cities Program for School Improvement, August 7, 1964).

sample contains only school systems in the largest size grouping. Among size groups, Harrison and McLoone have found that larger school systems tend to spend more per classroom and per student than smaller ones.¹ Thus, in the present sample, the relationship between enrollment and school support is expected to be positive.

Inputs--need. Variations in the need for education are measured by three ratios: public school enrollment as a proportion of the population (X_{18}), persons 5-19 years of age as a proportion of the population (X_{19}), and public school enrollment as a proportion of total enrollment (X_{20}). All three variables may be interpreted in a similar manner: as the size of the ratio increases, so does the relative need for educational services. The hypothesis concerning the behavior of these ratios is that as need increases, the relative share of public resources devoted to education will also increase. Thus, a positive relationship between each of the three independent variables and educational

¹Forrest W. Harrison and Eugene P. McLoone, Profiles in School Support: A Decennial Overview (Washington: Office of Education, 1965), Chap. VII.

expenditures as a proportion is hypothesized. The other three dependent variables--expenditures and taxes per student and per capita--bear a somewhat more complicated relationship to the measures of need which have been utilized.

Looking first at the number of students as a proportion of the total population, the relationship is expected to be negative with respect to per student expenditures but positive relative to per capita expenditures and taxes. This hypothesis is made on the assumption that public resources are relatively fixed in a political sense. That is, politicians will be willing to tax the population only to the extent of a politically determined taxable capacity. In communities where there are a large number of students relative to the population, educational expenditures will be greater than the expenditures in communities with a lower enrollment ratio. But assuming that the resources available to the public sector are relatively fixed, an additional expenditure for education would mean that non-educational services would

have less funds. Since the need for these non-educational expenditures is not necessarily less in places with higher enrollment ratios, the extra amount per student that could be allocated to education to meet the need of a higher enrollment ratio would be held down by demands for non-educational services. Otherwise the non-educational expenditures would have to diminish in direct proportion to increases in the enrollment ratio. This relationship, however, should not hold when expenditures are measured in per capita terms. Per capita educational expenditures should increase. This increase would be largely due to the measures being used. Both the enrollment variable and per capita expenditures are ratios. In the former case, the number of students is the numerator while population is the denominator. In expenditures per capita, educational expenditures is the numerator and population again is the denominator. An increasing enrollment ratio must be caused by an increase in the number of students, a decrease in the population, or an increase in enrollment larger than a simultaneous increase

in population. If the number of students increases relative to the population, the resulting expenditure rise would be a larger per capita amount even though the increase in educational expenditures per student declines. This mechanical phenomenon works in the opposite direction if per student expenditures is the dependent variable. In this case, the number of students is the numerator of the enrollment ratio and the denominator of per student expenditures. An increase in students relative to population without a proportionate increase in expenditures will result in a decline in expenditures per student. Thus, the hypothesis concerning the behavior of the enrollment ratio is partly mechanically based and partly based on expected political behavior.

The percentage of the population 5-19 years old (X_{19}) should behave similarly to the enrollment ratio on the assumption that most of this group is in school. The distribution of the total enrollment ratio between public and private schools (X_{20}), should behave in the same manner as the other need variables, but for slightly different

reasons. A high proportion of enrollees in public school means a higher enrolment ratio and hence the relationships discussed above should apply equally to this third need variable.

Inputs--ability to pay. Ability to pay is generally measured by income. In the present study, however, income is viewed as an attitudinal variable. Ability to pay is measured directly through the tax base. Comparable tax base measures are difficult to obtain because of differences in assessment procedures.¹ Because of this difficulty, two variables which measure the composition of the tax base have been used: the proportion of non-residential property value (X_{21}), and the amount of educational taxes paid by the non-residential base (X_{22}). The hypothesis is that communities with a relatively high proportion of non-residential valuation will be able to pay with less individual effort than communities which must rely on their residential property. This hypothesis is based on the fact that most school systems rely on

¹For one valiant attempt to overcome this difficulty, see Gerald W. Sazama, "Equalization of Property Taxes for the Nation's Largest Central Cities," National Tax Journal, XVIII (June, 1965), 151-61.

the property tax for local revenues.¹ Thus, both variables are expected to be positively related to each dependent variable, except the educational proportion where a neutral relationship is anticipated.

Inputs--competing non-educational demands. In an earlier chapter it was suggested that there would be an inverse relationship between educational and non-educational expenditures. The idea is that resources are relatively "fixed" or "tight" and that the demands for these two kinds of services are competitive. The variable used to measure the extent of competition is current non-educational expenditures (X_{23}). This measure is not as conceptually clear as some other variables used in the analysis. While non-educational expenditures is listed as an input, it is in fact an output. There is no way to show directly the interaction between educational and non-educational demands because they are measured by the

¹It is recognized that the presence of non-residential property involves costs as well as revenues. Thus, in an indirect sense these variables are also cost factors. The main cost to education, however, is an enrollment effect which has been accounted for above. See

Werner Hirsch, "Fiscal Impact of Industrialization on Schools," Review of Economics and Statistics, XLVI (May, 1964), 198. For an excellent summary of the voluminous literature on cost-revenue relationships, see Ruth L. Mace, Municipal Cost-Revenue Research in the United States (Chapel Hill: Institute of Government, University of North Carolina, 1961).

same variables. Thus, the result of the interaction between the demands is analyzed instead by relating educational and non-educational expenditures and by using the proportion that educational expenditures are of all local expenditures as a dependent variable. The anticipated relationship between non-educational expenditures and all dependent variables is negative, which is in line with the competitive hypothesis.

The governmental system--structure. As suggested earlier, the theoretical framework being utilized here conceives of the input factors discussed above as interacting with the system. The governmental structure of public schools, whether they are relatively independent or dependent, is the element of this system that is the central focus of the present study. As discussed in the previous chapter, a three-part continuum has been developed to measure the degree of independence or dependence of the school systems in the sample. In line with the reasoning developed in Chapter II, and with the results of past studies, it is expected that there will be a positive but weak correlation

between that variable representing the most independent school systems and the dependent variables. The correlation should be strongest with education as a proportion. The variable representing the middle category of school systems should show an even weaker or neutral relationship, and the dependent systems should correlate negatively.

The governmental system--intergovernmental fiscal relations. The second aspect of the governmental system which is of interest to this study is the impact of intergovernmental fiscal relations. In the absence of any large amount of federal aid to education in 1962, the variable that is apt to be most important is state aid measured in both per capita and per student terms. There has been considerable controversy in the past over whether it is useful to analyze the relationship between state aid and public expenditures. On the negative side, it has been suggested that since aid is a component of such expenditures, there will be a strong relationship between the two. This relationship, however, will not really add to an

understanding of variations in school expenditures.¹ The contrary view is that state aid may stimulate greater expenditures by reducing the propensity of communities to lower tax rates to attract industry and also through certain mandates that accompany aid.²

If the latter view is correct, then the nature of the relationship between state aid and educational expenditures and revenues can contribute significantly to an understanding of school fiscal behavior. In light of this discussion, it is clear that both measures of aid should be positively associated with all dependent variables.

The feedback factor. The final component of the analytical framework is the feedback effect of past decisions. Two variables have been used to express this

¹ Miner, op. cit., pp. 75-76.

² These views are expressed by both Kee and Brazier. Kee, op. cit., pp. 108-110; Harvey Brazier, City Expenditures in the United States (New York: Committee on Economic Development, 1959). The question of whether state aid is, in fact, stimulative, has also been the subject of some inquiry. See, for example, Renshaw, op. cit.; Seymour Sacks, Robert Harris and John Carroll, The State and Local Government: The Role of State Aid, New York State Comptroller's Studies in Local Finance, No. 3 (Albany, 1963); George A. Bishop,

"Stimulative versus Substitutive Effects of State School Aid in New England," National Tax Journal, XVII (June, 1964), 133-43; Alan K. Campbell and Seymour Sacks, "Metropolitan America: Fiscal Patterns and Governmental Systems" (to be published, 1966).

feedback. Capital expenditures for education in 1957 is a direct measure of past educational fiscal decisions and can measure the extent to which past capital expenditures are generating the present level of educational fiscal activity. The second variable, 1949 median family income, is a bit more remote from the feedback idea. It is actually a past input which influences present outputs only indirectly. Part of its statistical effect may also come about through its high relationship to 1959 income levels. The idea here is to see whether this input is more strongly related to the dependent variables than 1959 income. Both feedback variables are expected to be positively correlated with all dependent variables.¹

The Independent Variables for
the Multivariate Analysis

Fourteen independent variables have been retained for the multivariate analysis, but no more than eight are used in any given equation. Although it would be helpful to spell out the hypotheses regarding how combinations of variables will behave in any given equation, the complexity

¹An argument for the position that present levels of taxes are largely the result of past decisions is found in Clara Penniman, "The Politics of Taxation," Politics in the American States, ed. Herbert Jacob and Kenneth N. Vines (Boston: Little, Brown and Company, 1965).

of the relationships makes this a very difficult task. Rather than attempting to form hypotheses, the criteria for selecting variables for the multivariate analysis is presented. In the first place, an attempt has been made to pick variables representative of the parts of the analytical framework. Secondly, variables have been chosen which, on the basis of past studies and the simple correlation analysis, seem to reveal the most about both the educational and fiscal issues. The variables retained and the analysis of them will be presented in the following chapter.

The Parts of the Model Not Measured

There are a few gaps in the analysis due to an inability to measure certain parts of the model. For some factors proxy variables are used, and where this is the case it has been mentioned above. In other instances, no measure is applied because no method of quantification could be devised. One such case is the power of the demand articulators. Studies of power structure are numerous, but

they demand extensive issue analysis and interviewing which are beyond the scope of this study.¹ Secondly, state regulations with respect to education are not measured. These regulations do not lend themselves well to quantification.

Although all elements of the framework developed in this chapter cannot be precisely quantified, the conceptual and theoretical bases for the statistical analysis in the following chapter have been provided.

¹One interesting attempt to use the power structure analysis to understand educational support levels has been made by Bloomberg and Sunshine. They argued that the power of those making demands for change in the provision of education was an important factor in the resulting level of education offered. Warner Bloomberg, Jr., and Morris Sunshine, Suburban Power Structures and Public Education (Syracuse: Syracuse University Press, 1963).

CHAPTER V
A STATISTICAL ANALYSIS OF EDUCATIONAL
FISCAL BEHAVIOR

Introduction

The purpose of this chapter is to present and explain the results of the statistical analysis. In order to fulfill this purpose, the chapter is divided into three parts. In the first part, the simple correlation model is presented in the format of the theoretical framework. Secondly, some selected variables are put into a series of multiple regression equations. The behavior of these variables is discussed through the use of net regression coefficients, betas, partial correlations and elasticities. A concluding section ties together the entire statistical analysis.

The Simple Correlation Model

The results of the simple correlation analysis with respect to the dependent variables are presented in

Table 13. All of the intercorrelations are included in Appendix B. It must be stressed that these results provide only a preliminary clue concerning the reasons behind the variation in the dependent variables. It is included here for two reasons: to present a more complete quantification of the theoretical models, and to help the reader understand how the variables for the multivariate analysis have been selected.

The Simple Correlation Model
and the Educational Issue

As noted above, the educational issue is analyzed by using a quality measure, current educational expenditures per student, as a dependent variable. A discussion of the simple correlations between this dependent variable and each of the independent variables in the simple correlation model follows below.

Attitudes. Most of the attitudinal proxy variables show the expected relationships. Consistent with all past studies of educational expenditure determinants, income shows a strong positive relationship. Also strong and

TABLE 13
SIMPLE CORRELATIONS^a

Central City				
	X ₁	X ₂	X ₃	X ₄
	Current Educational Expenditures Per Student 1962	Total Educational Expenditures Per Capita 1962	Total Non-Aided Educational Expenditures Per Capita 1962	Current Educational Expenditures as a Percent of All Local Expenditures 1962
<u>Attitudes</u>				
X ₅ Median Family Income (1959)	.618	.628	.592	.057
X _{5.1} Per Capita Income (1959)	.529	.595	.428	.118
X ₆ Percent 12+ years of Education (1960)	-.007	.345	.162	.326
X ₇ Percent Owner Occupied (1960)	-.311	.037	.012	.559
X ₈ Mobility Index (1960)	-.130	-.154	-.151	-.037
X ₉ Dropout Rate (1963)	-.032	-.266	-.085	-.372
X ₁₀ Current Educational Expenditures Per Student OCC (1962)	.605	.284	.394	-.275
X _{10.1} Current Educational Expenditures Per Capita OCC (1962)	.735	.610	.562	.024
X ₁₁ Percent Negro (1960)	-.449	-.313	-.306	.034
X ₁₂ Percent Irish (1960)	.355	-.100	.050	-.546
X ₁₃ Percent Italian (1960)	.668	.129	.178	-.447
X ₁₄ Percent Pole-Czech. (1960)	.416	.102	.297	-.363

TABLE 13--Continued

Central City				
	X ₁	X ₂	X ₃	X ₄
	Current Educational Expenditures Per Student 1962	Total Educational Expenditures Per Capita 1962	Total Non-Aided Educational Expenditures Per Capita 1962	Current Educational Expenditures as a Percent of All Local Expenditures 1962
<u>Relative Cost</u>				
X ₁₅ Total Educational Expenditures Per Capita OCC (1962)	.665	.560	.512	.037
X ₁₆ Beginning Teachers Salary (1964)	.774	.610	.667	-.198
X ₁₇ Total Enrollment (1961)	.349	.267	.133	-.110
<u>Need</u>				
X ₁₈ Enrollment (Public) as Percent of Population (1961-62)	-.529	.249	.055	.749
X ₁₉ Percent Population 5-18 years (1960)	-.632	-.173	-.218	.400
X ₂₀ Public School Enrollment as Percent of Total Enrollment (1962)	-.439	.309	.082	.651
<u>Ability to Pay</u>				
X ₂₁ Percent Non-Residential Property Value (1962)	.367	-.177	-.042	-.398
X ₂₂ Educational Taxes (Proxy) paid by Non-Residential Property (1962)	.698	.537	.768	-.077
<u>Non-Educational Demands</u>				
X ₂₃ Current Non-Educational Expenditures Per Capita (1962)	.624	.230	.303	-.691

TABLE 13--Continued

	Central City			
	X ₁	X ₂	X ₃	X ₄
	Current Educational Expenditures Per Student 1962	Total Educational Expenditures Per Capita 1962	Total Non-Aided Educational Expenditures Per Capita 1962	Current Educational Expenditures as a Percent of All Local Expenditures 1962
<u>Governmental Structure</u>				
X ₂₄ Independent Systems = 1, Rest = 0 (1962)	.092	.286	.257	.325
X ₂₅ Middle Systems = 1, Rest = 0 (1962)	-.215	-.125	-.088	.036
X ₂₆ Dependent Systems = 1, Rest = 0 (1962)	.147	-.083	-.094	-.364
<u>Intergovernmental Fiscal Relations</u>				
X ₂₇ Educational State Aid per Student (1962)	.361	.312	-.204	.004
X ₂₈ Educational State Aid per Capita (1962)	.097	.429	-.145	.334
<u>Feedback</u>				
X ₂₉ Educational Capital Expenditures per Student (1957)	.103	.413	.184	.286
X ₃₀ Median Family Income (1949)	.484	.543	.595	.040

^aCorrelations of $\pm .418$ or higher are significant at the .01 level.

positive is the correlation of the central city educational expenditures with the expenditures made outside the central city--a result that is consistent with the "demonstration effect" hypothesis. Contrary to expectation, mobility and the dropout rate do not appear to have much of an influence on per student expenditures, but the relationships are generally in the expected direction. The relatively high coefficients of the ethnic variables are misleading. As pointed out in the previous chapter, these reflect regional concentrations of particular ethnic groups and explain very little about educational expenditures.¹ The result which is most contrary to expectations is the negative correlation between per student expenditures and the proportion of owner-occupied houses (-.311). Although the coefficient is not high, the negative sign suggests that the presumed importance which homeowners attach to education is overcome by the necessity of paying for it through the property tax.²

¹These results are consistent with those of another study which addressed itself to the regional bias problem. Sherman Shapiro, "Some Socio-economic Determinants of Expenditures for Education; Southern and Other States Compared," Comparative Education Review, VI (October, 1962), 160-66.

²Woo Sik Kee had a similar result in his simple correlation analysis. Woo Sik Kee, "City Expenditures and Metropolitan Areas: Analysis of Intergovernmental Fiscal Relations" (unpublished Ph.D. Dissertation, Syracuse University, 1964), p. 145.

Relative cost. All variables measuring the cost of education behave as expected. The very high correlation with teachers' salaries is due to the fact that salaries are a major component of educational expenditures. The outside central city expenditures show a strong association (.665), which is consistent with the labor market hypothesis. The two measures of these outside expenditures--one called attitudinal and the other a relative cost factor--are highly intercorrelated, indicating that either could serve as a measure of both the "demonstration effect" and the labor market. The strength of this variable is some indication that outside central city expenditures produce both demonstration and labor market effects on central city educational outlays. That there exists a labor market for teachers and hence a competitive price mechanism for their services is quite reasonable. But if the "demonstration effect" was not also operative, there would be no reason for central city schools to try to compete for the best and highest paid teachers. If they did not try to compete, it is unlikely that the correlation

coefficient would be as strong as it is.¹

Need. The three need variables all show the expected relationship. As noted above, however, the behavior of these ratios is very complex. Actually, the enrollment ratio (X_{18}), is of most direct relevance to expenditures for public education, and it is also a reflection of the other two need variables (X_{19} and X_{20}). The correlation of the enrollment ratio with per student educational expenditures ($-.529$), however, is not the most important thing to look at. To really understand the complex behavior of this variable it is necessary to look at its interaction with other independent variables and the relative response of expenditures to its variations (elasticity).

Ability to pay. The non-residential property in a community seems to be an important index of ability to pay, and hence is positively related to educational

¹This variable was also analyzed using the outside central city expenditures as a dependent variable and the central city expenditures as an independent variable in both multiple and simple regression analysis. Central city educational expenditures viewed as an independent variable in the regression equation is not as important in explaining outside central city expenditures. This finding substantiates further the existence of both labor market and demonstration effects.

expenditures (.367). The taxes paid by non-residential property have a higher correlation than the proportion of valuation that is non-residential (.698), partly because of the generally strong relationship between taxation and expenditures.

Competing demands. Non-educational expenditures correlate positively with educational expenditures per student (.624). This result is contrary to the initial hypothesis but it does not necessarily invalidate the more general proposition that education competes with other local services for scarce resources. The positive relationship found here may suggest that competition between educational and non-educational services is operative only with respect to incremental decisions which do not show up in the average levels. It may be that there are "public service" communities which are high relative to other communities with respect to both kinds of expenditures. Competition under these conditions would show up only when looking at the determinants of the proportional share of resources allocated to each kind of service.

The governmental system. The system variables behave exactly as expected. Those variables of central interest to this study, the independence-dependence continuum, show weak correlations (.092, -.215, and .147), and the direction of the relationships are as expected except in the case of the dependent systems. Independent systems show a slight positive correlation with expenditures but the relationship changes direction in the variable expressing the middle category between independence and dependence. The dependent system dummy variable correlates positively but the coefficient is very small. Thus, generally speaking, these results are consistent with the hypotheses outlined in Chapter II.

State aid per student yields a higher correlation than independence (.361 as opposed to .092). This difference is some indication that aid is a more important aspect of the political system than independence. The relative importance of these variables will be explored in the multiple regression analysis. These results, however, raise the interesting possibility that dependence on the

state is a more important determinant of educational expenditures per student than independence from other local governments.

Feedback. The final element in the model is feedback. It is interesting to note that there is a reasonably high correlation between the 1949 median family income and per student expenditures (.484). This is some indication that existing levels of school support are partially a reflection of past decisions to allocate resources to education, although the size of the correlation is also accounted for by the correlation between 1949 and 1959 income levels.

The Simple Correlation Model and the Fiscal Issue--Effort and Burden

The fiscal effort and burden required by educational outlays is the second issue which is initially explored through the simple correlation model. Two dependent variables are used: total educational expenditures per capita represents total effort and the per capita tax proxy represents local burden.

Attitudes. Income is highly related to both the expenditure and tax variables. Families with higher incomes are willing to make a greater effort and to assume more of a fiscal burden for education. The expenditure and tax coefficients are of the same order of magnitude as the coefficient for expenditures in per student terms (.628 for expenditures and .592 for taxes).

The proportion of the population with twelve or more years of education is positively associated with expenditures and taxes per capita (.345 and .162), quite unlike the finding with respect to expenditures measured in per student terms. Although the correlation coefficients are still low--particularly on the tax side--these results may be an indication that more favorable attitudes toward education do exist among those with more education themselves and that these attitudes are expressed through a greater willingness to make an effort or to assume a burden in order to provide educational services.

The proportion of owner-occupied housing is neutral with respect to the dependent variables. This finding is

again different from the relationship between this variable and per student expenditures where a definite negative relationship exists. Thus, with respect to fiscal effort and burden, homeowners do not seem to show any consistent behavior pattern.

The behavior of the mobility index and the dropout rate is similar to the finding relative to per student expenditures. It is clear that highly mobile communities and those with a high dropout rate do not favor large outlays for public education.

The "demonstration effect" of outside central city educational expenditures seems to be very operational relative to this fiscal issue. Measured in per capita terms, current educational expenditures outside the central city have correlations with central city educational expenditures and taxes of .610 and .562, respectively. These coefficients provide further evidence that the "demonstration effect" is an important concept for an understanding of both educational quality and fiscal burden or effort in large city school systems.

The ethnic variables are nearly neutral, except for the proportion of Negroes. As explained above, however, these results are mainly a regional phenomenon and do not add to the understanding of educational fiscal behavior.

Relative cost. The cost factor appears to have an almost identical relationship to educational outlays whether one is looking at the educational issue or the fiscal issue. The labor market effect measured by total outside central city expenditure levels has a high positive correlation with both expenditures and taxes (.560 and .512). The relationships of the other cost variables to per capita expenditures and taxes are in the same direction and of the same order of magnitude as is the case with the per student expenditures. This result is consistent with the hypotheses and is thus an indication that cost of educational services behaves exactly the same with respect to both the educational and fiscal issues.

Need. Among the need variables, the public school enrollment as a proportion of the population is still of greatest interest. As expected, the correlation with per capita expenditures is positive (.249). But the enrollment ratio is neutral with respect to the educational tax proxy.

The public school enrollment as a proportion of the total enrollment behaves in the same manner as the public enrollment as a proportion of the population. This indicates that the private enrollment is reflected in the proportion of the population attending public school. The proportion of the population 5-19 years old has low but negative coefficients (-.173 and -.218), which is contrary to the hypotheses. The reason for this result is not clear, however. Generally, the complex workings of the enrollment ratio are not completely understandable from its behavior in the simple correlation model.

Ability to pay. Contrary to expectations and to the relationship found with per student expenditures, the proportion of non-residential value shows a slight negative

correlation with educational expenditures and taxes per capita (-.177 and -.042). The correlation, however, is too low to be significant. Thus, all that this suggests is that the proportion of non-residential value may be important in understanding the educational issue but appears to be unrelated to that aspect of the fiscal issue represented by per capita educational expenditures and taxes. The educational taxes paid by non-residential property has shown a strong positive relationship, but this result is most likely due to the relationship between expenditures and taxes generally.

Competing demands. The correlation between the expenditures and tax variables on the one hand and non-educational expenditures on the other is not as strong as that found when per student expenditures is the dependent variable. The relationship does, however, remain positive. This is a further indication that if there is a competition between educational and non-educational services for resources, it expresses itself

in incremental decisions and is not manifested in average fiscal levels.

The governmental system. The independence-dependence continuum bears the same relationship to per capita expenditures and taxes as it did to per student expenditures. The correlation coefficients remain low which may be a further indication that this variable is not an important element in the determination of fiscal levels for education. In this instance, the variable representing dependence has a slight negative association with educational expenditures and taxes per capita. But the correlations are so low that the relationship may be interpreted as being neutral.

State aid is strongly and positively associated with per capita expenditures. On the tax side, however, there is a slight negative relationship. The negative sign does not necessarily mean, however, that aid is substitutive of local tax effort. In order to make such a determination it is necessary to look at the relative change in taxes in response to a given change in aid level.

This will be done later in the chapter through the use of the elasticity coefficient.

Feedback. Both the 1957 level of educational capital expenditures and the 1949 median family income have fairly high and positive correlations with expenditures and taxes. This finding is further evidence of the importance of past decisions on present fiscal levels.

The Simple Correlation Model and the Fiscal Issue--Allocation

Current educational expenditures as a proportion of the expenditures made by all local governments within the school system boundaries (X_4), is used as a measure of the allocation of resources to education relative to other local services. This aspect of the fiscal issue is quite different from the effort and burden issue discussed above. Here the question of competition between the educational and non-educational services at the local level is considered directly. The differences between the simple correlations with this allocation variable and those with the other dependent variables are quite pronounced.

Attitudes. Contrary to expectations, median family income does not seem to be related to the educational proportion (.057). The level of education of the community residents is positively correlated (.326). Similarly, the percent of owner-occupied housing units shows a rather strong positive correlation of .559. This is interesting in that the owner-occupied housing variable is negatively associated with per student expenditures (-.311), and neutral with respect to per capita expenditures and taxes. This result is an indication that people who own their own homes are inclined to keep all public expenditures down. Between educational and non-educational services, however, homeowners tend to favor education. In addition, it is clear that homeownership is also a general index of the nature of the community. There is a positive association, for example, between homeownership and the enrollment ratio of .412, and with the proportion of the population 5-19 years old, the coefficient is .437. Thus, a high proportion of owner-occupied housing units is an indication that some central cities have suburban-like characteristics.

which leads to a greater relative emphasis on education.

As hypothesized, mobility does not show much of a relationship to the educational proportion. A transient population apparently keeps all public expenditures down and does not distinguish between education and other services in the way that homeownership does. The dropout rate shows the expected negative relationship ($-.372$), with the educational proportion. This may be partially the result of a high need for other urban services (such as police and fire) in communities with a large number of school dropouts.

Surprisingly enough, the level of expenditures outside the city measured in per student terms has a slightly negative correlation with the educational proportion. The correlation is small ($-.275$), however, and thus can be interpreted as being neutral as is the case with outside central city expenditures measured in per capita terms. This finding suggests that the "demonstration effect" has an impact on the level of educational expenditures, but does not affect the allocation of

resources between educational and non-educational services.

The ethnic variables do have some high correlations, but for reasons stated above, they do not really explain how concentrations of these groups affect educational fiscal behavior.

Relative cost. The cost variables do not yield the expected relationships. The labor market for educational personnel, as measured by outside central city expenditures, does not affect the allocation of public resources between educational and other services. As a matter of fact, teachers' salaries and enrollment show slight negative correlations of $-.198$ and $-.110$, respectively. There is no logical reason for a negative relationship here. The coefficients, however, are sufficiently small so that the relationship can be classified as neutral and the negative sign interpreted as a chance effect. In general, cost does not appear to be a significant input factor for determining the relative share of resources going to education.

Need. Unlike cost, the need for education is highly associated with the relative share of resources which this function receives. This result is consistent with the hypotheses. The correlation between the enrollment ratio and the educational proportion is .749. This result is partly a mechanical phenomenon--the greater the proportion of the population in public schools, the greater the share of resources these schools will get. This same reasoning would apply to the other need variables as well.

Ability to pay. The proportion of valuation that is non-residential is negatively associated with education's share of local resources, while a neutral relationship was expected. The coefficient of $-.398$ may reflect the fact that communities with a lot of non-residential property have significant non-educational demands.

Further, the non-residential value is negatively associated with the enrollment ratio ($-.571$), indicating that communities with high proportions of non-residential property also have relatively fewer children in school.

In view of the high positive association between the

enrollment ratio and the educational proportion, it is clear that this ratio is partly responsible for the result with respect to non-residential value. Looking at educational taxes paid by this non-residential property, the correlation with the educational proportion is neutral ($-.077$), which is in line with the expectations. In general, the ability to pay is not important in determining education's share of local resources. Ability to pay for education means ability to pay for other services as well. Thus, other kinds of variables become determinant.

Competing demands. Non-educational expenditures show a strong negative association with the educational proportion ($-.691$). This result is some indication that competition exists between educational and non-educational services. While higher non-educational expenditures are associated with higher educational expenditures as well, the level of the latter does not go up sufficiently to even maintain its relative position. If it did, the correlation here would be zero.

The governmental system. The independence-dependence continuum variables, which represent the focus of the study, behave exactly as predicted. In communities with independent systems, the schools get a larger proportion of local resources. The simple correlation coefficient is .325. Communities whose schools are in the middle category show no relationship with the allocation of resources and the variable representing dependent systems is negatively correlated (-.364), with the allocation variable. While the coefficients for the three kinds of school systems are small, they are still higher than those with the other dependent variables. Since the initial hypothesis was that school governmental structure would be much more important in explaining the relationship between educational and non-educational expenditures than in explaining the educational levels, this finding was expected.

Per capita state aid shows a higher correlation with the educational share than independence (.334). This is further evidence that dependence on the state is a more

influential force than independence from other local governmental authorities.

Feedback. While feedback does not seem to be as important to the educational proportion as to the levels, the 1957 capital outlays do have a positive correlation of .286. This result suggests that past decisions to engage in educational capital projects has generated sufficient current expenditures to raise education's share of local resources for current operations.

The Simple Correlation
Analysis--Highlights

If nothing else, the above discussion of the simple correlation analysis has pointed up the incredible complexity of educational finance. In view of the number of relationships discussed above, it would be well to summarize this section of the chapter by highlighting what seem to be the most important relationships. It is these relationships which are explored further in the next section.

The analytical model outlined in the previous

chapter and utilized here appears to be a useful tool for gaining further understanding of the relationships being explored. The educational issue in large cities has been conceptualized by looking at educational expenditures per student as a system output and a dependent variable. The inputs of the model help to explain the variations in output. Of the proxy variables for attitudes, income and the outside central city educational expenditures are the most powerful. The latter variable can also be viewed as a cost element and, in this sense, is the most interesting of the relative cost input factors. The third kind of input is need which is best measured by the enrollment ratio. The negative relationship found may be partly a mechanical effect but may have some more interesting implications as well.

The non-residential property proportion as an index of ability to pay, contributes positively to educational levels. A final input, competing demands for non-educational expenditures, shows a positive rather than a negative relationship. This means that if there

is competition between educational and non-educational functions for resources, the decisions which reflect this competition are incremental and do not manifest themselves in average levels. The governmental system, through which the inputs express themselves, has been depicted by the independence-dependence continuum variables and state aid. As expected, independence has a slight positive relationship to educational levels. In the case of schools in the middle category, between independence and dependence, the correlation was negative. For dependent systems there is a positive but small correlation. State aid seems to be an even more important aspect of the system; its correlation is higher than that of independence.

These same relationships hold for the fiscal effort and burden issue where the outputs or dependent variables are expressed as educational expenditures and taxes per capita. The exception to this generalization is the enrollment ratio which is positively related to the fiscal effort and burden variables, and the non-residential property value which is unrelated to these variables.

The final output or dependent variable is education's share of local resources. Among the attitudinal variables, the proportion of owner-occupied housing units seems to be the most important; the relationship is positive. Cost factors are not important. The enrollment ratio representing need is positively and highly correlated with the educational proportion. Under ability to pay, a high proportion of non-residential property is negatively associated with the share of resources being allocated to education. A final input--competing non-educational demands--brings out the competitive nature of educational and non-educational services with a strong negative correlation. The system variables have the same kind of relationship to the educational proportion as they did to the other dependent variables.

The Multivariate Models

In this section of the chapter, the educational issue and each aspect of the fiscal issue is dealt with separately in a series of multivariate models. Ideally,

one could take a variable(s) representing each part of the analytical framework, and put them all in a single model. This, in fact, will be done initially to some extent. Due to two kinds of difficulties, however, it will be necessary to disassemble the initial equations into several parts.

The first difficulty which makes the disassembly process necessary is the presence of a single variable with a great deal of explanatory power. When this occurs, the powerful variable may obscure the behavior of other variables in the equation and hence conceal the reasons for variations in the dependent variable. A second kind of difficulty that is related to the first is known as multicollinearity. This means that two or more variables in the equation are doing approximately the same job due to the fact that they bear a linear relationship to one another. In such a case, the process of netting out the effects of each variable on the others distorts the coefficients in the equation so that, in some instances, neither is statistically significant. Thus, it may be

possible to have an equation with a very high R^2 but in which none of the independent variables are statistically significant.¹ The way out of this problem is not simply to develop a model which is relatively free of multicollinearity. This would mean ignoring variables which might contribute significantly to an understanding of the dependent variable. Interrelationships among independent variables are prevalent in socio-economic research of the type attempted here. In fact, it is important to the analysis to understand the nature of these interrelationships. Thus, the entire equation will be presented initially and then be disaggregated in the process of analysis.²

¹Discussions of this problem and how to deal with it are sparse. One brief description may be found in: Arthur S. Goldberger, Econometric Theory (New York: John Wiley & Sons, Inc., 1964), pp. 192-94.

²Another way of handling these difficulties is through a set of simultaneous equations. It has been noted by Ezekiel and Fox, however, that this technique presents some serious interpretation problems. For this reason the less sophisticated technique described above has been used. See Mordecai Ezekiel and Karl A. Fox, Methods of Correlation and Regression Analysis (New York: John Wiley & Sons, 1959), Chap. 24, especially pp. 431-32. Also see Goldberger, op. cit., Chap. 7.

The Educational Issue

On the basis of the analytical framework and the reasoning and simple correlations discussed above, a multivariate model using eight independent variables has been constructed. In this model, median family income (X_5), is used as an attitudinal variable.¹ Educational expenditures per student outside of the central city (X_{10}), is employed to measure both the attitudinal "demonstration effect" and the labor market cost factor. Need is measured by the public school enrollment ratio (X_{18}). The ability to pay is represented by the proportion of the total gross valuation made up of non-residential property (X_{21}). The non-educational demands are depicted by current non-educational expenditures per capita (X_{23}). The governmental system variables are state aid per student (X_{28}), and the two dummy variables representing the three-part independence-dependence continuum (X_{24} , X_{25}). For X_{24} , independent systems are given a value of 1 and the rest

¹The numbers of the variables, i.e., X_5 , refer to those used in the simple correlation analysis.

of the school systems, 0. For X_{25} , those school systems in the middle category, between independence and dependence, are assigned a value of 1. The variable representing dependence cannot be included because all three variables together would be highly intercorrelated and distort the results. Its effect can be implied, however, when the values assigned to X_{24} and X_{25} are 0. As suggested earlier, the dependent variable in the analysis of the educational issue is current educational expenditures per student (X_1).

The resulting regression equation with the standard errors in parentheses is shown below:

Equation 1.

$$\begin{aligned}
 X_1 = & \$81.24 + .032 X_5 + .368 X_{10} - 1.455 X_{18} \\
 & \quad (.017) \quad (.098) \quad (2.923) \\
 & + 2.012 X_{21} + .242 X_{23} + .233 X_{27} \\
 & \quad (.911) \quad (.257) \quad (.132) \\
 & + 4.417 X_{24} - 34.584 X_{25} \\
 & \quad (21.804) \quad (18.657)
 \end{aligned}
 \qquad R^2 = .828$$

The coefficient of multiple determination is .828, meaning that the above equation "explains" about 83 percent of the

variation in current educational expenditures per student. Although statistical significance has only limited meaning where a "judgment sample" is used, some indication of significance can be derived through use of Student's t test. Using this criterion, it may be noted that only outside central city expenditures (X_{10}), is significant at the .01 level, and only the proportion of non-residential property (X_{21}), is significant at the .05 level. The enormous standard errors of the other independent variables are responsible for this result. This equation reflects both of the problems discussed above. Expenditures for education outside the central city completely dominate the equation. This fact can be demonstrated by comparing the beta coefficients which are shown in Table 14. The beta of the outside central city expenditures, .491, is more than twice the beta of the next most powerful variable, income, whose coefficient is only .237.

The changes brought about by placing these variables into the multivariate model are clearly demonstrated by comparing the partial and simple correlations. As

TABLE 14
 BETAS AND PARTIAL AND SIMPLE CORRELATION COEFFICIENTS
 WITH RESPECT TO CURRENT EDUCATIONAL EXPENDITURES
 PER STUDENT, 1962

	X ₅	X ₁₀	X ₁₈	X ₂₁	X ₂₃	X ₂₇	X ₂₄	X ₂₅
Betas	.237	.491	-.056	.221	.116	.145	.025	-.203
Partials	.336	.578	-.093	.385	.175	.317	.038	-.331
Simples	.618	.605	-.529	.367	.624	.361	.309	-.215

shown in Table 14, only the outside central city expenditures (X₁₀), the proportion of non-residential value (X₂₁) and state aid (X₂₃), maintain their levels of correlation when the eight variables are put in a single model. Part of this is due to the dominance of outside central city expenditures and part is due to multicollinearity in the model.

The nature of the multicollinearity problem can be better understood by looking at the intercorrelations among the independent variables. The coefficients (simple correlations) are shown in matrix form in Table 15. High coefficients on this table are evidence of multicollinearity. In order to reduce this problem without obscuring important

TABLE 15
SIMPLE CORRELATION MATRIX OF SELECTED INDEPENDENT
VARIABLES FOR THE ANALYSIS OF CURRENT EDUCATIONAL
EXPENDITURES PER STUDENT

	X ₅	X ₁₀	X ₁₈	X ₂₁	X ₂₃	X ₂₇	X ₂₄	X ₂₅
X ₅	-	.355	-.145	.451	.319	.200	.360	-.063
X ₁₀		-	-.451	.384	.434	.076	.028	-.126
X ₁₈			-	-.571	-.488	-.092	.100	.116
X ₂₁				-	.270	.000	-.042	-.138
X ₂₃					-	.148	-.155	-.242
X ₂₇						-	.017	.145
X ₂₄							-	-.537
X ₂₅								-

relationships, two variables are removed from the equation-- non-educational expenditures (X₂₃), and the percentage of non-residential value (X₂₁). X₂₃ is dispensable because the hypothesized competition between educational and non-educational services does not show up when comparing average expenditure levels. Although the non-residential property ratio is significantly related to per student expenditures in equation 1, this variable is also highly correlated with income and the enrollment ratio. For this

reason it has been removed. Finally, the two variables representing the independence-dependence continuum are removed in order to see whether they are an important contributor to the explanatory power of this model. The results of these adjustments are shown in equations 2 and 3.

Equation 2.

$$\begin{aligned}
 X_1 = & \$108.54 + .030 X_5 + .409 X_{10} - 5.88 X_{18} \\
 & (0.18) \quad (.097) \quad (2.51) \\
 & + .216 X_{27} - 1.52 X_{24} - 40.99 X_{25} \\
 & (.141) \quad (21.58) \quad (17.86) \quad R^2 = .789
 \end{aligned}$$

Equation 3.

$$\begin{aligned}
 X_1 = & \$92.50 + .036 X_5 + .355 X_{10} \\
 & (.016) \quad (.097) \\
 & - 6.93 X_{18} + .253 X_{27} \\
 & (2.66) \quad (.150) \quad R^2 = .736
 \end{aligned}$$

In equation 2 the non-educational expenditures and the proportion of non-residential value have been eliminated. The major effect of this alteration is to greatly enhance the importance of the enrollment ratio. Other coefficients decrease but only slightly. There is a slight cost of eliminating the two variables in terms of the model's

explanatory power. The R^2 in equation 1 is .828 and in equation 2 it is .789. This means that the two variables are worth about 3.9 percentage points in explanatory power. The relative decrease in R^2 is only .5 percent which means that the cost of the alteration is very slight. The removal of the independence-dependence continuum variables alters the above picture very little. The net regression coefficients change only slightly. The R^2 falls from .789 to .736 which is an absolute decrease of 5.3 percentage points and a relative decline of only .7 percent. The result is an important indication that the relative importance of school government in explaining per student expenditures for education is quite insignificant.

One further alteration in the model clarifies the relationships of the variables further. The dominating variable--outside central city educational expenditures--is removed in equation 4, but the independence-dependence variables are left in. Equation 5 is identical to 4, only the independence-dependence continuum is removed.

Equation 4.

$$X_1 = \$72.10 + .078 X_5 - 9.96 X_{18} + .293 X_{27}$$

(.016) (2.88) (.173)

$$- .31.32 X_{24} - 41.73 X_{25}$$

(25.33) (22.19)

$$\underline{R}^2 = .663$$

Equation 5.

$$X_1 = \$110.56 + .070 X_5 - 11.22 X_{18} + .350 X_{27}$$

(.015) (2.81) (.174)

$$\underline{R}^2 = .624$$

The distortions caused by the presence of the dominating variable can be seen clearly in the above equations. With outside central city expenditures taken out, the importance of income clearly comes forth. In fact, the strength and statistical significance of all the variables are enhanced by this operation. The cost in terms of explanatory power, however, is high. The \underline{R}^2 falls from .789 to .663, or 12.6 percentage points in absolute terms and 16.0 percent, relatively. The elimination of the independence-dependence continuum variables from this model has very little effect. The \underline{R}^2 falls from .663 to .624, representing an absolute decline of 3.9 percentage points and a relative drop of .6 percent. This is even further evidence that school government is not an important determinant of educational

expenditures per student.

A summary of all of these relationships is shown in Table 16. Here the beta coefficients are used to compare the relative power of each of the variables both within and among the five equations described above. Also included in the table is an indication of statistical significance in terms of the t test described above. This test is made with respect to the regression coefficients.

From Table 16 it is possible to generalize about the educational issue by looking at all five equations together. In the first place it is clear that the combined impact of the labor market and the demonstration effect is the single most important explanation for variations in per student expenditures among large central cities. The power of outside central city educational expenditures is so great that it dominates the regression analysis and is not altered much by removing or adding other variables.

An attitudinal variable seems to be second in importance--median family income. Its importance, however, is masked by the outside central city expenditures so that

TABLE 16
BETA COEFFICIENTS WITH RESPECT TO CURRENT EDUCATIONAL EXPENDITURES PER STUDENT
1962^a

Equa- tion No.	Median Family Income X_5	Outside Central City Educational Expenditures Per Student X_{10}	Enrollment Ratio X_{18}	Percent Non- Residential Value X_{21}	Current Non- Educational Expenditures Per Capita X_{26}	Educational State Aid Per Student X_{27}	Independence-Dependence Continuum		R^2
							Independence = 1	Middle = 1	
							X_{24}	X_{25}	
1	.237 [†]	.491**	-.056	.227*	.116	.147 [†]	.025	-.203 [†]	.828
2	.218	.545**	-.226*			.136	.009	-.241*	.789
3	.264*	.473**	-.267*			.159 [†]			.735
4	.572**		-.303**			.184	-.179	-.245 [†]	.663
5	.511**		-.432**			.220 [†]			.624

^a Levels of significance are calculated with respect to the regression coefficient and adjusted for degrees of freedom. The symbols used indicate the following levels of significance: [†] = .10, * = .05, ** = .01.

the strength of income is not apparent until the outlying expenditure variable is removed from the equation.

Representing the need for education is the enrollment ratio. This variable does not appear to be important in the over-all model (equation 1) but is enhanced by removing from this model the non-residential property value proportion and the non-educational expenditures. Once these variables are removed, the enrollment ratio moves up from a beta of $-.056$ to one of $-.226$ at a significance level of $.05$. Here is an instance where a knowledge of the nature of multicollinearity can bring about a greater understanding of the behavior of a given independent variable.

The enrollment ratio is related to the proportion of non-residential valuation. The simple correlation between the two is $-.571$. This is a logical relationship; a community with relatively more residential property will have more children in school and hence a higher enrollment ratio. But non-residential value is a measure of the ability to pay for education and is positively associated

with school expenditures. In fact, this positive association is (in equation 1), significant at the .05 level with a net regression coefficient of 2.01. In other words, a one percent increase in the proportion of non-residential value leads to an increase of \$2.01 in per student educational expenditures. This fact provides a partial explanation for the strong negative association between the enrollment ratio and per student expenditures that shows up both in the simple correlations and in the multiple regression equations in which the non-residential property variable has been removed. In a sense, a high enrollment ratio not only means a higher need but also less ability to pay. Thus, two countervailing forces are at work. A mechanical reason for the negative relationship between the enrollment ratio and per student expenditures was presented in the previous section of this chapter. This mechanical explanation in conjunction with the more functional ability to pay problem certainly makes the impact of the enrollment ratio on per student expenditures more understandable.

Moving from the input side of the analytical model to the governmental system, the amount of state aid per student is the next variable in order of importance. The magnitude of its importance is enhanced slightly by removing the dominating influence of outside central city expenditures.

Of greatest interest to this study is the fact that the presence of the independence-dependence continuum variables add very little to the explanation of per student expenditures for education. Further, the dummy variable representing independence is absolutely powerless and insignificant statistically. What all of this adds up to is the rejection of the null hypothesis that the formal independence or dependence of school systems is an important factor in explaining variations in educational expenditures per student. While the direction of the relationship suggests that school systems which are relatively independent provide slightly higher per student expenditures than dependent systems, the relationship is not important when one considers the other factors which contribute to per

student expenditure levels.

A further understanding of the four variables which do seem important can be gained by looking at the regression coefficients in more detail and also by examining the elasticities. The regression coefficient and elasticity of outside central city educational expenditures will be taken from the context of equation 3, while the other variables will be analyzed from equation 5. These coefficients are shown in Table 17 below.

TABLE 17
REGRESSION COEFFICIENTS AND ELASTICITIES FOR SELECTED
INDEPENDENT VARIABLES WITH RESPECT TO CURRENT
EDUCATIONAL EXPENDITURES PER STUDENT, 1962

	Equa- tion No.	Median Family Income X ₅	Outside Central City Educational Expenditure Per Student X ₁₀	Enroll- ment Ratio X ₁₉	State Aid Per Student X ₂₇
Regression Coefficient	3		.355		
Elasticity Coefficient	3		.410		
Regression Coefficient	5	.070		-11.23	.350
Elasticity Coefficient	5	1.104		- .561	.116

Looking first at outside central city expenditures, it can be noted that an increase in such expenditures of one dollar will lead to a thirty-six cent increase in central city educational expenditures per student. Put in terms of elasticity, a one percent increase in outside city expenditures leads to a .41 percent increase in educational expenditures per student inside the central city. This elasticity coefficient reveals something very important about educational fiscal behavior both in large central cities and in metropolitan areas in general.¹ This finding means that central city school systems operate in a metropolitan context that determines, to a great extent, what level of education is provided and how much this level costs. The importance of the metropolitan context stressed in previous chapters is brought out clearly by these results. It is, in fact, a crucial element in the determination of the level of

¹It is important to point out here that this elasticity coefficient shows the response of the dependent variable to changes in the independent variable at the point of means. The formula used is:

$$e = \frac{\bar{X}_i}{\bar{X}_d} b$$

Where \bar{X}_i is the mean of the independent variable, \bar{X}_d the mean of the dependent variable and b is the regression coefficient.

educational services offered in central cities both in terms of the community's attitude toward education and in terms of education's cost.

The level of educational services in central cities is not only stimulated by greater levels of such services in its hinterland but also by its own level of income. For every dollar of additional median family income in a city, per pupil educational expenditures tend to rise about seven cents. In terms of elasticity, school expenditures are very responsive to income. A one percent rise in income will lead to a 1.1 percent rise in per pupil expenditures.

The need for education as measured by the enrollment ratio has a reverse effect on the level of services offered. Each percentage point of enrollment ratio is associated with a decrease in per student expenditures of \$11.23. A one percent increase in the ratio will lead to a .56 percent decrease in expenditures.

Aid from state governments is helpful to educational service levels. One dollar of aid per student is worth

thirty-five cents in per student expenditures, and a one percent increase in aid tends to result in a .1 percent increase in educational service levels. These particular results are difficult to interpret since part of the state aid in question is contained in the current expenditures figure which is the dependent variable. Whether state aid does stimulate local effort or merely replaces it, can best be analyzed on the tax side in the context of the fiscal issue.

The Fiscal Issue--Effort and Burden

This aspect of the fiscal issue will be approached in a manner similar to that of the previous section. Four of the five equations used for the educational issue will be utilized again with two dependent variables--total educational expenditures per capita and the per capita educational tax proxy. Equation 1 has not been replicated in this section for two reasons. First, there is the multicollinearity problem discussed previously. Secondly, the non-residential value proportion included in equation 1 was not related to per capita expenditures or taxes in the

simple correlation model. Since the interrelationships among independent variables are exactly the same here, it will not be necessary to retrace all of the steps taken in the previous section. Instead, the four equations to be used are shown in Table 18 on the expenditure side, and Table 19 on the tax side. These tables, like their counterpart, Table 16, present beta coefficients and the significance of the regressions by the t criterion.

On the expenditure side it is clear that the educational expenditure outside of the central city still dominates the picture. When this variable is removed from the model, 14.8 percentage points of explanatory power is lost. The relative decline is 25.3 percent, indicating again that educational expenditures outside the central city are a very important influence on the educational expenditures in the central city.

Income is also a very important determinant of per capita educational expenditures in large central cities. Its significance, however, is masked by the outside expenditures variable, so that the importance of income

TABLE 18

BETA COEFFICIENTS WITH RESPECT TO TOTAL EDUCATIONAL EXPENDITURES PER CAPITA, 1962^a

Equa- tion No.	Personal Income Per Capita X _{5.1}	Outside Central City Educational Expenditures (Current) Per Capita X _{10.1}	Enrollment Ratio X ₁₈	Educational State Aid Per Capita X ₂₈	Independence-Dependence Continuum		R ²
					Independence = 1	Middle = 1	
					X ₂₄	X ₂₅	
6	.312 [†]	.484 ^{**}	.398 ^{**}	.087	-.149	-.190	.58
7	.241	.494 ^{**}	.348 [*]	.130			.56
8	.561 ^{**}		.286 [†]	.119	-.139	-.218	.43
9	.499 ^{**}		.233	.161			.40

^a Levels of significance are calculated with respect to the regression coefficient and adjusted for degrees of freedom. The symbols used indicate the following levels of significance:
[†] = .10, * = .05, ** = .01.

TABLE 19
BETA COEFFICIENTS WITH RESPECT TO TOTAL NON-AIDED EDUCATIONAL
EXPENDITURES PER CAPITA, 1962^a

Equa- tion No.	Personal Income Per Capita X ₅₁	Outside Central City Educational Expenditures (Current) Per Capita X _{10.1}	Enrollment Ratio X ₁₈	Educational State Aid Per Capita X ₂₈	Independence-Dependence Continuum		R ²
					Independence = 1 Middle = 1		
					X ₂₄	X ₂₅	
10	.352*	.540**	.488**	-.619**	-.201	-.195	.550
11	.258	.546**	.423**	-.565**			.523
12	.629**		.362*	-.584**	-.191	-.227	.364
13	.544**		.296†	-.530**			.330

^a Levels of significance are calculated with respect to the regression coefficient and adjusted for degrees of freedom. The symbols used indicate the following levels of significance:
† = .10, * = .05, ** = .01.

does not emerge until outside central city expenditure is removed from the equation.

The enrollment ratio behaves very differently here than it did with respect to per student expenditures. In the first place, the relationship is positive, meaning that a higher ratio leads to higher per capita expenditures. However, the significance of the relationship is also dependent on the outside central city expenditures variable.¹ In this case, the interrelationship between these two independent variables works to the advantage of the enrollment ratio, while in the case of per student expenditures it was the other way around. From these results, it is clear that the need for education as measured by the enrollment ratio is positively associated with the expenditure effort the community will make for education. Thus, a need increase does lead to a greater effort on the part of the community even though this effort is not sufficient to increase per student expenditures.

Turning to the governmental system, the relative importance of the independence-dependence continuum is

¹The intercorrelation between enrollment ratio and outside central city expenditures per capita is $-.233$.

still very slight. The regression coefficients are not statistically significant and both variables are negatively associated with per capita educational expenditures. By removing the variables from equation 6, the absolute loss of explanatory power is only 2.3 percentage points and the relative decline is 3.9 percent. The loss from equation 8 is 3.4 percentage points absolutely or 7.8 percent in relative terms. It is clear that the structure of school government has little to do with the fiscal effort the community is willing to make for education. State aid is likewise not a very powerful determinant of educational expenditures per capita, though it does contribute positively to such expenditures.

The tax side of the fiscal issue is even more interesting. As in the case of expenditures, income and outside central city educational expenditures are very important and significant. The positive relationship with the enrollment ratio is both stronger and more significant on the tax side with and without the dominating influence of the outlying educational expenditure level. This is

quite a different result from the neutral simple correlation found earlier. The effect of dropping outside central city expenditures from the equation is an absolute reduction in explanatory power of 18.6 percentage points, or 33.8 percent in relative terms. In short, the outside central city variable is a very important influence on the school tax burden in the city.

The independence-dependence continuum again is unimportant. Both variables are negatively related to school taxes, but the relationship is not statistically significant. The loss of explanatory power incurred by eliminating these variables from equation 10 is 2.7 percentage points absolutely and 4.9 percent relatively. The absolute loss with respect to equation 12 is 3.4 percentage points and the relative decline 9.3 percent.

State aid exerts a very powerful negative influence on educational taxes that is significant at the .01 level. This means that as the amount of state aid to education is increased, the educational taxes tend to decrease. This result is clear evidence that aid to

education is at least partially a substitute for local effort. The extent of the substitution effect, however, cannot be determined without looking at the elasticity coefficients. This will be done below. The main point to be made here is that state aid is a far more important element of the fiscal burden issue than is the independence or dependence of schools.

Table 20 shows the regression coefficients and elasticities of the independent variables with respect to total educational expenditures per capita. These coefficients are shown in the context of two separate equations. For outside central city expenditures, equation 7 has been used, while equation 9 has been taken as the context for the other variables.

The table shows that a one dollar increase in income leads to a three cent increase in per capita expenditures. The elasticity is nearly unity which means that per capita educational expenditures are quite responsive to changes in income. A one percent increase in per capita income leads to a .87 percent increase in total

TABLE 20
REGRESSION COEFFICIENTS AND ELASTICITIES FOR
SELECTED INDEPENDENT VARIABLES WITH RESPECT
TO TOTAL EDUCATIONAL EXPENDITURES
PER CAPITA, 1962

	Equa- tion No.	Personal Income Per Capita X _{5.1}	Outside Central City Educational Expenditures Per Capita X _{10.1}	Enroll- ment Ratio X ₁₈	State Aid to Educa- tion Per Capita X ₂₈
Regression Coefficient	7		.320		
Elasticity Coefficient	7		.458		
Regression Coefficient	9	.029		1.161	.280
Elasticity Coefficient	9	.873		.290	.084

educational expenditures per capita. Outside central city expenditure levels are more powerful in explaining the dependent variable than income, but are not as relatively stimulative. A dollar increase in the level of outside central city expenditures leads to a thirty-two cent increase in per capita educational expenditures in the city. In terms of elasticity, a one percent increase in the outlying expenditures is associated with a .46 percent

response from the dependent variable. This result is similar to that found with respect to per student expenditures and strengthens the contention that metropolitanism is of great importance as a context.

The enrollment ratio has a positive influence on per capita educational expenditures. Each percentage point of enrollment ratio is worth \$1.16 in educational expenditures. The elasticity of .290 is a further indication that per capita educational expenditures are responsive to the need for education measured in terms of the enrollment ratio.

State aid is not a powerful determinant of per capita expenditures. A dollar of state aid per capita is associated with twenty-eight cents in educational expenditures. A one percent increase in aid leads to a .084 percent increase in expenditures.

A replication of Table 20 for the tax proxy variable is shown in Table 21. Income bears the same relationship to educational taxes as it did to expenditures, although the relative response of taxes to income is greater.

TABLE 21
REGRESSION COEFFICIENTS AND ELASTICITIES FOR
SELECTED INDEPENDENT VARIABLES WITH RESPECT
TO TOTAL NON-AIDED EDUCATIONAL
EXPENDITURES PER CAPITA, 1962

Equa- tion No.	Personal Income Per Capita X _{5.1}	Outside Central City Educational Expenditures Per Capita X _{10.1}	Enroll- ment Ratic X ₁₈	State Aid to Educa- tion Per Capita X ₂₈
Regression Coefficient 11		.363		
Elasticity Coefficient 11		.777		
Regression Coefficient 13	.033		1.508	-.944
Elasticity Coefficient 13	1.352		.559	-.423

A one percent increase in income tends to lead to a 1.352 percent increase in educational taxes. Part of the size of the elasticity coefficient can be accounted for by the fact that capital expenditures are included in this tax proxy. The important point to be made is that educational taxes and expenditures per capita are very sensitive to changes in income. Personal income is, in fact, a very important element in the fiscal burden issue.

The outside central city expenditures show up as a strong determinant of educational taxes. One dollar of such expenditure leads to a thirty-six cent increase in educational taxes. The elasticity of .777 is higher on the tax side than for expenditure. This is an important result. It means that the central city response to the combined labor market and demonstration effects that the outside central city school systems exert on central cities are greatest on the tax side. Here is a clear-cut case where the activities of governments outside of the central city are contributing to higher tax payments on the part of central city residents.

High enrollment ratios also have a greater impact on the tax side than they did on expenditures. One percentage point of enrollment ratio is worth \$1.51, while a one percent change in this ratio is associated with a .56 percent change in educational taxes. Thus, the local fiscal response to the need for education is great. Increased enrollment ratios do seem to contribute to greater fiscal burdens for the purpose of providing

education. That the response to the enrollment ratio is greatest on the tax side, is an indication that this response occurs mainly at the local level.

The non-local fiscal contribution to public schools consists mainly of state aid to education. As noted above, such aid leads to lower taxes. The elasticity, however, is most revealing. A one percent rise in state aid leads to a .42 percent decrease in educational taxes. If aid were totally substitutive, the elasticity would be unity; if it decreased local effort, the elasticity would be greater than unity. In this case, therefore, it is clear that aid is only partially a substitute for local effort. Over half of state aid is additive.

With respect to fiscal burden and effort, income, outside central city expenditures, and the enrollment ratio contribute positively to both expenditures and taxes for education. In terms of the analytical framework, positive attitudes concerning the importance of education, its cost and the need for it explain well over half of the variation in the fiscal outputs which measure the

effort and burden required by the provision of public education. The independence or dependence of the school system is not important when these other factors are considered. Aid to education, on the other hand, is. Effort and burden, however, are only a part of the fiscal issue. The other part is the allocation of resources between education and other local public services.

The Fiscal Issue--Resource Allocation

From the simple correlation model, it is quite clear that a very different set of relationships is involved in explaining variations in resource allocation than was the case with respect to fiscal levels. For this reason it is necessary to develop a completely different model from that used above.

The simple correlation analysis suggests that neither cost nor ability to pay are important inputs relative to the resource allocation output. With respect to cost, it is difficult to separate those aspects of a given cost variable that are attributable to education

as opposed to non-educational costs. With regard to ability to pay, that ability is equally applicable to both educational and non-educational services. This leaves attitudes toward education, the need for it, and the competing non-educational demands as input factors. It is also worthwhile to explore the relationship between these input factors and the two aspects of the governmental system--state aid to education and the independence-dependence dummy variables. On the basis of the results of the simple correlation analysis and the above reasoning, six independent variables have been chosen initially for the model. The proportion of owner-occupied dwelling units (X_7), is an attitudinal variable. The enrollment ratio (X_{18}), represents need, and per capita non-educational expenditures (X_{23}), is the competing demands variable. The system variables, state aid per capita (X_{28}), and the independence-dependence continuum (X_{24} , X_{25}), are the same as in earlier models. The dependent variable is current educational expenditures as a percentage of the current expenditure of all local governments made within

the school systems' borders (X_4). The resulting equation is shown below.

Equation 14.

$$\begin{aligned}
 X_4 = & 14.3\% + .077 X_7 + .939 X_{18} - .041 X_{23} \\
 & \quad (0.79) \quad (.236) \quad (.021) \\
 & + .093 X_{28} + 3.13 X_{24} + .387 X_{25} \\
 & \quad (.071) \quad (1.62) \quad (1.54)
 \end{aligned}
 \quad R^2 = .726$$

Only the enrollment ratio is significant at the .01 level. Non-educational expenditures and independence are significant at the .10 level and the other variables are below this standard. Thus, although the model explains 73 percent of the variance, it is difficult to interpret. This is because of the multicollinearity problem.

The intercorrelations among the independent variables are shown in Table 22. The table demonstrates that the three input variables are highly related to one another. Communities with a high proportion of owner-occupied housing units have high enrollment ratios and low non-educational expenditures. This reflects the fact that such communities are "suburban like" in their characteristics which includes children in school and less demand for non-educational

TABLE 22
SIMPLE CORRELATION MATRIX OF SELECTED INDEPENDENT
VARIABLES FOR THE ANALYSIS OF CURRENT EDUCATIONAL
EXPENDITURES AS A PERCENT OF THE CURRENT
EXPENDITURES OF ALL LOCAL GOVERNMENTS
OVERLYING THE SCHOOL SYSTEM

	X ₇	X ₁₈	X ₂₃	X ₂₈	X ₂₄	X ₂₅
X ₇	-	.412	-.641	.045	.261	.072
X ₁₈		-	-.488	.354	.100	.116
X ₂₃			-	.082	-.155	-.242
X ₂₈				-	.091	-.081
X ₂₄					-	-.537
X ₂₅						-

services. The high inverse relationship between the enrollment ratio and non-educational expenditures (-.488), may reflect competition between educational and non-educational needs.

Because of the nature of the multicollinearity in the model, equation 14 has been broken down into three sub-models each using one input variable with the three system variables. Further, from each of these sub-models, the independence-dependence continuum variables have been removed in order to determine how the absence of these

variables affects the models. The resulting six regression equations are presented in Table 23.

Taken separately, each of the three input variables contributes significantly to the understanding of variations in the allocation of resources to education. Homeowners, as suggested in the simple correlation analysis, seem to place a relatively high value on education, as their presence causes the proportion of resources allocated to education to increase. Each one percent of the proportion of owner-occupied dwelling units is worth .28 percent in education's proportion of local resources.

The enrollment ratio, which represents the need for education, also leads to a greater relative share of the resources being allocated to local schools. One percent of enrollment ratio is associated with an increase in education's share by an increment of 1.28 percent.

Non-educational expenditures have a negative relationship to education's proportion of resources. As the level of such expenditures increases, the educational proportion of all expenditures decreases. This finding

TABLE 23

REGRESSION COEFFICIENTS, STANDARD ERRORS, AND COEFFICIENTS OF MULTIPLE DETERMINATION OF SELECTED INDEPENDENT VARIABLES WITH RESPECT TO CURRENT EDUCATIONAL EXPENDITURES AS A PERCENT OF THE CURRENT EXPENDITURES OF ALL LOCAL GOVERNMENTS OVERLYING THE SCHOOL SYSTEM, 1962a

Equation No.	Constant Factor	Percent Owner-Occupied X ₇	Enrollment Ratio X ₁₈	Current Non-Educational Expenditures Per Capita X ₂₃	Educational State Aid Per Capita X ₂₈	Independence-Dependence Continuum		R ²
						Independence = 1 X ₂₄	Middle = 1 X ₂₅	
15	13.0%	.282** (.085)			.211* (.088)	4.14† (2.17)	1.72 (2.02)	.471
16	12.4%	.339** (.082)			.212* (.090)			.408
17	7.0%		1.28** (.226)		.066 (.077)	4.49* (1.70)	1.63 (1.63)	.646
18	7.2%		1.41** (.236)		.053 (.083)			.566
19	36.8%			-.087** (.020)	.199* (.080)	4.02* (1.94)	.715 (1.88)	.561
20	39.4%			-.096** (.019)	.199* (.084)			.487

^aLevels of significance are adjusted for degrees of freedom. The symbols used indicate the following levels of significance: † = .10, * = .05, ** = .01.

lends empirical support to the hypothesis that education is in competition with other services for "tight" local resources.

Turning to the governmental system variables, it is found that state aid has a positive and generally significant relationship to the educational proportion. The statistical significance of the relationship is obliterated, however, when it is placed in the same model with the enrollment ratio. This is because aid is partially based on enrollment so that the presence of both variables in the same equation masks the importance of aid. In any case, these results do indicate that the state can and does influence the allocation of resources at the local level. This may be a trivial finding, however, indicating that education's share of resources is increased simply by virtue of the fact that the state is adding to the resources available and earmarking this addition for education.

Of great interest to this study is the finding that independent school systems do seem to increase

education's share of local resources by about 4 percent. This finding supports the initial hypothesis that while independence is not an important determinant of educational fiscal levels, it does influence the allocation of resources in favor of education and hence decreases the share of resources going to other local services. The removal of the continuum variables from the equation has no effect on the other independent variables but does have a much greater impact on the coefficient of multiple determination than was the case with per student educational expenditures or educational expenditures and taxes per capita. The absolute reduction in percentage points of explanatory power resulting from the removal of the continuum from equations 15, 17 and 19 is 6.3, 8.0, and 7.4, respectively. The comparable relative declines are 13.4 percent, 12.3 percent, and 13.2 percent.

In order to assess the relative strength of each independent variable in explaining variations in resource allocation, the betas of equations 14-20 are shown in Table 24. Taken as a whole (equation 14), the model

TABLE 24

BETA COEFFICIENTS WITH RESPECT TO CURRENT EDUCATIONAL EXPENDITURES
AS A PERCENT OF THE CURRENT EXPENDITURES OF ALL LOCAL
GOVERNMENTS OVERLYING THE SCHOOL SYSTEM, 1962^a

Equation Number	Percent Owner- Occupied X ₇	Enrollment Ratio X ₁₈	Current Non- Educational Expenditures Per Capita X ₂₃	Educational State Aid Per Capita X ₂₈	Independence-Dependence Continuum		\bar{R}^2
					Independence = 1 X ₂₄	Middle = 1 X ₂₅	
14	.124	.481**	-.260†	.137	.236†	.030	.726
15	.454**			.311*	.313†	.135	.471
16	.546**				.310†		.408
17		.656**		.097	.339*	.127	.646
18		.721**		.078			.566
19			-.556**	.292*	.303*	.056	.561
20			-.614**	.292*			.487

^aLevels of significance are calculated with respect to the regression coefficient and adjusted for degrees of freedom. The symbols used indicate the following levels of significance:
† = .10, * † .05, ** = .01.

"explains" 72.6 percent of the variation in the dependent variable. A clear generalization that emerges from looking at all of the equations is that the most powerful input variables in order of their relative strength are the enrollment ratio, non-educational expenditures, and percent owner-occupied. Of secondary strength are the system variables. Here state aid and independence are of comparable power.

The elasticities of percent owner-occupied, the enrollment ratio, non-educational expenditures, and state aid are shown in the separate contexts of equations 16, 18 and 20 in Table 25. The enrollment ratio is the most elastic of the independent variables. A one percent increase in this ratio is associated with .747 percent relative increase in education's share of the resources available to local public goods and services. Education's share of these resources is next most responsive to changes in owner occupancy followed by non-educational expenditures and finally state aid.¹ These elasticities show the relative response of the educational proportion to changes

¹Independence has not been considered here because an elasticity of a dummy variable has no clear meaning.

TABLE 25

ELASTICITIES OF SELECTED INDEPENDENT VARIABLES WITH
RESPECT TO CURRENT EDUCATIONAL EXPENDITURES AS A
PERCENT OF THE CURRENT EXPENDITURES OF ALL LOCAL
GOVERNMENTS OVERLYING THE SCHOOL SYSTEM, 1962

Equation Number	Percent Owner- Occupied X ₇	Enrollment Ratio X ₁₈	Current Non- Educational Expenditures Per Capita X ₂₃	State Aid to Educa- tion Per Capita X ₂₈
16	.483			
18		.747		
20			-.340	.128

in each independent variable. From this perspective the most elastic variable, the enrollment ratio, has the most influence on resource allocation.

From the above analysis, certain generalizations can be made about the nature of local resource allocation. Greater shares of such resources are enjoyed by education when the need for this service, as measured by the enrollment ratio, is relatively great. The positive attitudes of homeowners toward education relative to other local public services is also a factor that increases education's share of available resources. Thirdly, competing demands

for other local services, as measured by the level of non-educational expenditures, also helps to explain variations in resource allocation. In this case, a high level of non-educational expenditures leads to a lower proportion of all local expenditures going to education. This finding is consistent with the hypothesis that there is competition between educational and non-educational public goods and services for available resources.

These input factors are imposed on a governmental system which itself partially explains variations in resource allocation. Aid to education from the state leads to a bigger share for education, but not necessarily beyond the amount that total resources are increased by the provision of aid. Of great interest is the finding that independent school systems do seem to get a greater share of local resources than other kinds of systems. This substantiates an initial hypothesis.

Highlights of the Statistical Analysis

The focus of this analysis has been on the hypothesis that the independence or dependence of large city school systems is not important relative to other factors in determining the levels of taxes and expenditures for education. A second related hypothesis was that independence would affect the allocation of resources to local public goods and services in favor of education. The statistical analysis in this chapter has given considerable empirical support to these positions.

Beyond the question of the relative importance of school government in explaining educational fiscal behavior, the present study has sought to produce a greater understanding of educational finance. In order to achieve this purpose, general models have been devised to find out which variables account for variations in a number of educational fiscal characteristics. In this pursuit, two kinds of issues in the field of educational finance have been explored--one educational, the other fiscal. In the following chapter some policy implications of the findings

with respect to these issues are discussed. First, however, the major determinants of the dependent variables or the fiscal outputs that are associated with each issue are summarized below.

The Educational Issue--Per Student
Educational Expenditures

The most comprehensive model (equation 1) "explains" 83 percent of the variance in per student expenditures. The most powerful variables in order of their importance are: outside central city educational expenditures, income, the enrollment ratio and state aid.

The Fiscal Issue--Per Capita
Educational Expenditures and Taxes

The most comprehensive model on the expenditure side (equation 6) "explains" 58 percent of the variance while on the tax side (equation 10), 55 percent is explained. Part of the reason that these models have less explanatory power than equation 1 is that non-residential value and non-educational expenditures are not used in them. The most powerful variables in order of importance on both expenditure and tax sides are

outside central city educational expenditure, the enrollment ratio, income and state aid. Aid is actually most important on the tax side, although the relationship is negative. The elasticity indicates, however, that a good portion of the aid tends to be additive to local effort. Also of interest is the fact that the enrollment ratio bears a positive relationship to per capita taxes and expenditures for education, while the relationship is negative with respect to expenditures per student.

The Fiscal Issue--Current Educational Expenditures as a Percent of Current Expenditures for All Local Public Goods and Services

The most comprehensive model for explaining resource allocation (equation 14) "explains" 73 percent of the variance. The most potent variables in order of their relative power are: enrollment ratio, non-educational expenditures, percent owner-occupied, independence, and state aid to education. The most important findings here are the positive relationship between independence and the educational proportion and also the inverse relationship between

non-educational expenditures and education's proportion of all local expenditures. The latter finding supports the hypothesized competition between education and other local services.

CHAPTER VI

SOME IMPLICATIONS AND CONCLUSIONS

Introduction

This final chapter examines some implications of the statistical analysis. The relative importance of certain variables in explaining variations in educational fiscal outputs has two kinds of implications. In the first place, much can be learned about the nature of the problems being faced by large city school systems, and large cities in general, which are related to the provision of public education. Secondly, the results of this study can highlight the direction or approach of policy changes which could alleviate these problems.

The Problems of Large Cities and Their School Systems

The findings of the statistical analysis reported in the previous chapter suggest which variables are and which are not important elements in the support of public

schools. These findings clearly demonstrate that a school government's relative independence or dependence is not an important determinant of per student or per capita educational fiscal levels in large cities. The result is just as strong on the tax side as it is on the expenditure side. The finding suggests that the educator's seemingly timeless concern with this formal aspect of school government is not appropriate in large cities. Those variables which have been found to be important are worthy of further discussion because they point up the nature of the school-related problems faced by large central cities.

The key to an understanding of such problems is the importance of the city's metropolitan context. The educational expenditures of outside central city school systems have a powerful effect on the educational expenditures and taxes of central cities. The relatively high level of outside central city educational expenditures means a higher cost for central city education because of the existence of the labor market effect and because of a "demonstration effect" which compels central cities

to attempt to pay salaries comparable to those paid in the more affluent suburbs.

Reinforcing this central city-outside central city relationship is the level of income in both places. Income is a major determinant of school support both in the central city and in the outlying areas.¹ Yet, the cities have lower incomes than their outside central city areas. In the metropolitan areas analyzed in the present study, the average median family income in the central city is \$5,936 while in the urban fringe surrounding the city the figure is \$7,064. The city's lower income level has a double impact on its ability to provide public education. First is the fact that the demands made for education on the input side of the model will not be great due to relatively low income levels. Secondly, the relatively high incomes outside of the central city makes it easier for outside central city school systems to increase their own educational fiscal levels. This, in turn, increases the cost of education in the central city because the city schools operate in the same labor market

¹A separate analysis, not reported in the present study, has been made of the determinants of school support outside the central city. Income is the most powerful variable for explaining variations in school support among outside central city areas. The same finding is reported for a different sample by Campbell and Sacks. Alan K. Campbell and Seymour Sacks, "Metropolitan America: Fiscal Patterns and Governmental Systems" (to be published, 1966).

as their generally wealthier suburbs, and because of the demonstration effect of outside central city educational expenditures.

Adding to the central city's woes is what educators call "municipal overburden." This refers to the fact that the cities have a greater need for non-educational public goods and services than do the suburbs. Such services as welfare, police, fire, sewerage, and the like are most greatly needed in the city. The present study has found that education in the central city competes with such services for scarce public resources. The fact of "municipal overburden" in the city and the competition for resources have a number of possible implications for central city education.

In the first place, the outside central city school systems with relatively less demand for non-educational services have more of their resources free to devote to education. This state of affairs affects the central city in the same manner as does the relative income levels in central city and outside central city areas. The city is at a

disadvantage because there are greater relative demands on its resources than is true of outside central city areas. Secondly, the relatively lower non-educational demands in the suburbs which allow them to spend more for their schools in turn raises the cost of education in the city.

Further, the strain which non-educational demands places on the central city may be harmful to education, to the non-educational services or possibly to both. The educator's concern with the "municipal overburden" issue has been limited to its impact on educational expenditures.¹ It has been observed by Polley that there are wide variations in municipal levies as a proportion of all local public expenditures. The proportion was highest in central cities and declined as the community being analyzed became less urban. From this finding, he suggested that cities with high municipal service needs will have a harder time paying for education. He proposed a correction in the state aid formula to compensate for this.² Polley's study

¹Paul Mort and his associates have addressed themselves to this question. Their concern, however, presents a distinct break with the traditional educational finance literature. See John W. Polley, "Variations in Impact of Municipal Government on Ability to Support Schools," A New Approach to School Finance, 1961 Review of Fiscal Policy for Public Education in New York State, ed. Paul R. Mort, Staff Studies (Albany: New York Educational Conference Board, 1961), pp. 22-34.

²Ibid.

was a good beginning toward an assessment of the impact of the different mixes of local public goods and services on education. The results of the study are in accord with his findings and suggest the importance of future research in this area.

Another possible effect of "municipal overburden" and the competition between education and other local services that is seldom mentioned in the education literature is that central cities may not devote sufficient resources to the non-educational services. This possibility could also mean that both kinds of services--education and non-education--suffer as a result. One of the findings of this study which illustrates this point is that independent school systems get a greater proportionate share of the public resources allocated to all local functions. On the surface, this result appears to be a plus for independence. There is increasing evidence, however, that school performance is linked to various aspects of the environment that are affected by other local public goods and services such as housing,

urban renewal, welfare, health and hospitals, and public safety.¹ Thus, the underfinancing of those public functions which affect the health and welfare of the residents of the school community could hamper educational achievement. In the long run, it is possible that gains for the education function could be achieved at the expense of these other kinds of local public services which are related to school performance. Put another way, increases in local effort for the purpose of providing education with more resources could eventually result in decreased resources for other local public functions which, in turn, could defeat the purposes of the original increase by lowering school performance. In this manner, the competitive conditions between education and other local public services can be harmful to the functioning of either or

¹ Much of this evidence is based on the University of Pittsburgh's Project Talent which relates test scores to school characteristics. Project Talent, Studies of the American High School (Pittsburgh: University of Pittsburgh, 1962). An application of this project that positively links test scores to characteristics of the home and community was done by James and his associates. H. Thomas James, J. Alan Thomas and Harold S. Dyck, Wealth, Expenditures and Decision Making for Education (Stanford: Stanford University Press, 1963), Chap. V. Three separate studies that will explore some of these relationships are currently underway as a part of the Carnegie-sponsored Large City Education Systems Study by Jesse Burkhead, Thomas Fox and John Holland.

both participants in the contest for scarce public resources.

In any case, it is clear that relative to the school systems outside the central city, the city is at a disadvantage. This situation is brought about by the city's "municipal overburden" and the fact that education must compete with other services for public resources.

These problems, which have been highlighted by the results of the statistical analysis, arise generally for two reasons. In the central city, the over-all mix of input factors analyzed in the study does not produce demands for educational services that are comparable to the services which other kinds of school systems produce. Secondly, this difficulty is compounded by a "horizontal" kind of interdependence. Central cities operate in a metropolitan context where the operation of their school systems is highly related to that of the systems outside of the central city. Further, education must compete for scarce resources with highly demanded non-educational local public services. There is no easy way out of these

difficulties. In the short run, the mix of inputs and the horizontal interdependence cannot be altered. What can be done is to turn from the inputs to the governmental system in an attempt to alter the transformation of the demands made on that system into outputs.

The Governmental System and
the Large City Problem

The educators' advocacy of independent school government is partially motivated by a search to overcome some of the difficulties outlined above. The findings of this study clearly indicate that this is not the answer. In fact, the analysis in the previous chapter indicates that a more useful approach is the strengthening of the "vertical" kind of interdependence between the different "levels" of government.

With respect to education, the growth of such interdependence was noted in Chapter I, where increases in aid to elementary and secondary education from state and federal governments were shown. Beyond this, the flows of all intergovernmental funds clearly indicate that:

. . . the extent of the interdependence of the parts of the [American governmental] system has continuously increased. The image of the system as possessing relatively independent levels . . . is positively inaccurate.¹

Intergovernmental aid both from the federal and state governments is one avenue through which the central city problems discussed above could be overcome. The main advantage to the use of aid for this purpose is the broader revenue bases of state and federal governments. Where the central city school system's perceived taxable capacity is low and the need for education and other local services is high, the allocation of the resources of broader based governments to the city school systems can help make up for deficiencies on the input side.

In spite of this potential advantage of intergovernmental aid, it is argued here that at the present time aid is not directly meeting the central city problems and may even be reinforcing them.

In the first place, the nature of the formulae for state aid to education is such that outside central city areas are getting more education aid than are the

¹Alan K. Campbell, "National-State-Local Systems of Government and Intergovernmental Aid," Annals of the American Academy of Political and Social Science, XXXLIX (May, 1965), 95. In this article, Campbell clearly demonstrates the interdependence of the system by looking at intergovernmental fiscal flows.

central cities. Because of the interdependence between the city and its suburbs, the higher level of educational expenditures in outside central city areas, which is partially made possible by relatively high state aid, again raises the educational costs in central cities. In this sense, state subsidies to outside central city school systems are increasing the needs of central cities for school funds but the states are not compensating the cities for this in their aid formulae. This interesting set of relationships suggests a possible new equalization role for aid to education. The findings of this study clearly indicate that it would be appropriate for states to compensate central cities for these extra costs which are partly a result of the present state aid system.

Secondly, the programmatic nature of state aid in general presents difficulties for both central city education and the central city's fiscal position in general. As noted earlier, central cities have greater non-educational expenditure requirements than do outside central city areas. At the same time, state aid covers

only minimally, if at all, those functions such as police, fire, street lighting, sewerage and street maintenance that are responsible for the central city's greater non-educational requirements. A functional breakdown of state aid is shown in Table 26. This breakdown clearly indicates that aid to those functions which account for the central city's higher non-educational expenditures is almost non-existent and that there is very little non-programmatic general aid. The differences in the mix of service needs between central and outside central city areas thus alters the relationship between state aid and the need for it, with the outside central city communities emerging as the gainers and central cities as the losers.¹

The repercussions of this unhappy situation on the central cities' fiscal problems are clarified by the findings of this study. The competition between educational and non-educational local functions for resources is heightened by the present state aid system. As already suggested, high non-educational needs can hamper the ability of schools

¹Campbell makes a similar point, *ibid.*, p. 104.

TABLE 26

STATE AID TO LOCAL GOVERNMENTS: AID CATEGORIES
AS A PERCENTAGE OF TOTAL AID, 1962^a

Function	Percentage
General	7.6
Education	59.4
Highways	12.2
Welfare	16.3
Health and Hospitals	1.8
Other	<u>2.7</u>
Total	100.0

^aU.S. Bureau of the Census, U.S. Census of Governments: 1962, Compendium of Government Finances, Vol. IV, No. 4 (Washington: U.S. Government Printing Office, 1964), Table VII.

to pay for the level of education demanded. Because these non-educational needs are not aided by the state and because central city school systems are generally not aided in relation to their needs, the central city is in a very "tight" fiscal position relative to outside central city areas. The result may be distortions in local resource allocation which could work to the disadvantage of either education or other local public functions or possibly

all functions.

A final area where the state aid system is not helping central city school systems as much as it might involves the whole issue of whether aid is used as a substitute for local effort or whether it is additive to that effort. The present results clearly show that state aid to education has both kinds of effects. About one-half of the aid received by large central city school systems is used to replace local school taxes, while the rest is additive to those taxes. Put another way, school taxes tend to decrease by only about half of the amount of state aid to education. Other analyses using different samples have found aid to be about 20 percent substitutive and 80 percent additive.¹ One possible explanation for this difference is that in areas where there is a higher demand for non-educational services, there may also be a greater tendency to use aid to replace local education taxes. If local resources are in short supply relative to the demand for them, aid to education may act to free such resources which could then be used to meet the

¹For the sample used in the present study, the elasticity coefficient between state aid and education taxes was $-.42$ in central cities but only $-.18$ in outside central city areas. Campbell and Sacks in their study had a coefficient of $-.21$, *op. cit.*, Chap. V.

non-educational needs. If this is true, it means that a given amount of aid to education will not be as effective (with respect to education) in central cities as in outside central city areas. The present criteria for extending educational aid does not recognize this possibility. If aid is to be effectively utilized, however, more information is needed concerning the nature of aid's substitutive effect.

Further Research

While the present study has found school government in large central cities to be a relatively unimportant factor in the support of public education, some of the variables which are important point the way to vital areas of further research in the field of metropolitan finance generally and educational finance specifically. At the broadest level, the nature of the horizontal interrelationships both among municipalities and functions in metropolitan areas deserves further inquiry. The relationship between educational and non-educational expenditures as well as that between the central city and the

outside central city educational expenditures warrant further examination. Much could be gained by a detailed time series analysis of a few metropolitan areas showing how these relationships hold up over time. Such a study might be combined with a cross sectional analysis which would use all of the school systems in a given metropolitan area as observations. The advantage of this would be the avoidance of the distorting effects of differences in state-local governmental systems and regional influences.

A second area in which further research is needed is intergovernmental aid. This study has brought out the fact that the present system of state aid has not adapted itself to the central city's educational and fiscal problems. At the same time, however, state aid in conjunction with the emergence of greater federal aid to education offer a potential solution to these difficulties. In order to achieve this potential, more about the workings of the aid mechanism needs to be known.

For one thing it is important to determine the

conditions under which aid is additive to local effort and those that produce a substitutive effect. Earlier it was suggested that the demands for non-educational services may be a condition of greater substitution. Another possibility involves the nature of state mandates. The findings of this study, that aid is only half substitutive, are contrary to those of James and his associates.¹ James constructed a test for examining the relationship between local initiative and state support for schools. Local tax levy rates and school expenditures were reduced by the amount mandated by the state and then compared to school expenditures which were initiated by non-local sources. The inverse relationship found between the two was taken as evidence of a substitutive effect of state support on local levies and expenditures. James concluded that:

. . . unless the state interferes specifically and purposefully to inhibit or prevent the substitution, state funds will be used rather generally to reduce local property taxes.²

It may well be that the findings of this study

¹ James et al., op. cit., Chap. II.

² Ibid., p. 39.

reflect the fact that state support is coupled with mandates that do produce an additive effect. But it is important to understand the mandate mechanism and its impact on school support. A reasonable hypothesis is that central city residents desire a higher level of educational services than they feel they can afford without such aid. Thus, they are willing to make the increased effort required by state mandates in order to get the increment of resources from the state beyond that which they are providing locally.

If this hypothesis is true (and the findings of this study give it considerable plausibility), it suggests that aid to education may involve an intricate threshold effect. The question is, how much of a mandated effort will a given community accept in order to receive additional revenues from the state? The findings here do not provide the answer, but they do point up the importance of the question. Thus, research into the nature of state mandates and their impact upon the inputs of educational decision making is needed. State aid formulae can be used

to stimulate more effort at the local level, but more knowledge is needed about the nature of state mandates in order to use this mechanism effectively.

Concluding Remarks

Generally, it appears that aid must be used to do more than simply equalize fiscal effort. It is likely that great amounts of additional resources are needed to overcome the problems of central city school systems. The concentration of the disadvantaged in the city coupled with a lack of resources and the horizontal interdependencies discussed in this study have created a severe educational and fiscal problem in the city that is being compounded by the present distribution of socio-economic characteristics and the present system of intergovernmental aid. How much additional resources are needed in the city is ultimately a question of values. But a meaningful value judgment can only be made when the real issues and problems are in focus. The present analysis has attempted to do just this. It is hoped that this study has provided

additional insights into the educational and fiscal issues of public school finance. School government and other factors that influence educational fiscal outputs in large central cities operate in a governmental and fiscal environment that is highly interdependent. Rather than debating the unimportant issue of independence versus dependence, educators and all public officials should turn their attention to the interdependence of the governmental system and the problems that come with it.

APPENDICES

APPENDIX A

FISCAL AND SOCIO-ECONOMIC CHARACTERISTICS

OF THIRTY-SEVEN CENTRAL CITIES

TABLE 30

VARIABLES: COST AND NEED, FOR THIRTY-SEVEN CITY SCHOOL SYSTEMS

Cost		Need		
Beginning Teachers' Salary 1964	Total Public Enrollment (000) 1961	Public Enrollment as a Per- cent of Population 1962/60	Percent Population 5-18 Years Old 1960	Public Enrollment as a Per- cent of Total Enrollment 1960
\$5,300	1,004	13.3	21.3	66.3
5,350	489	14.4	22.7	67.6
5,500	545	21.7	22.5	95.8
5,300	250	12.9	23.2	61.2
5,300	230	17.5	24.8	74.1
5,000	175	19.2	25.2	85.0
4,500	188	23.3	26.4	98.9
5,000	138	16.4	23.6	76.9
5,000	106	14.4	22.4	72.1
5,275	107	15.1	24.0	65.3
5,840	93	12.4	18.9	65.1
4,930	91	13.3	22.6	60.9
4,700	131	20.2	25.8	94.6
3,725	94	15.6	26.2	65.2
5,000	74	12.6	26.4	57.5
5,500	110	19.9	27.0	88.2
4,940	101	18.2	23.2	79.3
5,100	70	13.5	23.3	61.7
4,900	82	15.5	23.7	71.6
4,500	103	21.3	27.3	88.8
5,100	94	19.6	24.6	85.2
4,560	101	21.3	29.0	90.2
5,150	71	14.9	22.6	65.9
5,000	91	18.4	24.3	84.7
4,800	68	16.7	24.0	86.0
4,700	88	19.7	24.4	83.5
5,600	66	16.3	23.1	79.6
4,150	48	14.5	24.5	70.5
5,000	75	18.6	23.7	80.6
5,525	73	19.0	23.5	86.7
4,100	70	21.2	26.7	94.9
4,300	68	24.6	25.1	90.4
5,150	42	13.9	22.1	65.8
4,800	52	16.9	24.6	72.5
5,000	43	14.0	25.4	56.1
4,400	54	18.3	21.8	90.6
5,100	52	17.6	25.7	72.7
4,950	145	17.2	24.2	77.0
443	179	3.2	1.9	12.0

from: U.S. Bureau of Census, U.S. Census of Governments: 1962 Compendium
 IV, No. 4 (Washington: U.S. Government Printing Office, 1964); U.S.
Bureau of Population and Housing: 1960 Census Tracts (Washington: U.S. Government
 Printing Office, 1964); National Education Association, Research Division, Salary Schedules for Classroom
Teachers Report 1964 R-13 (Washington: National Education Association, 1964).

TABLE 27

OF CURRENT EDUCATIONAL EXPENDITURES FOR PUBLIC ELEMENTARY
AND SECONDARY SCHOOLS IN THIRTY-SEVEN CITIES
(in percent)

Instruc- tion	Operation and Maintenance	Fixed Charges	Attendance Services	Health Services	Transportation Services	Other
64.1	10.7	14.3	.7	1.2	3.7	3.8
72.6	15.9	6.9	.5	.6	.5	.4
71.5	13.9	6.6	.5	2.0	1.4	.2
68.6	16.2	6.8	.7	2.4	.9	1.0
71.2	15.5	7.9	1.0	-	1.2	.9
72.4	13.1	9.5	.1	1.9	.3	1.1
84.8	9.6	.2	.3	1.4	1.3	.3
66.1	18.7	9.7	.5	1.2	.3	1.0
68.2	17.5	3.2	.6	.8	.6	.4
75.4	17.1	2.3	.7	-	1.1	.6
73.5	14.2	7.0	.6	.2	.8	.3
74.5	16.5	2.8	.8	2.2	.2	.8
78.7	11.7	1.2	.3	1.6	.2	2.7
75.6	15.8	1.8	.8	.7	1.9	-
70.8	17.0	6.3	.8	.7	.5	.1
76.1	11.9	4.7	2.0	1.7	.5	.3
76.4	16.7	3.2	.1	.7	.3	.2
67.0	13.6	13.4	.7	2.2	.5	.9
69.1	17.1	9.0	.7	.5	.6	.4
80.9	11.0	4.4	.3	-	-	.4
71.6	11.7	10.3	.8	1.7	.6	.8
80.1	11.9	3.5	.2	.2	-	1.9
72.7	19.9	.6	1.6	1.0	1.0	.7
81.0	13.8	3.0	-	-	-	.1
72.6	15.2	6.2	.8	1.2	1.0	-
72.7	13.6	9.5	.6	.6	1.2	-
71.1	14.3	3.1	.9	2.6	.9	2.7
79.2	15.0	2.0	.5	.2	.2	.1
73.5	15.7	5.8	.8	.3	.5	.9
73.0	14.3	5.2	1.0	1.0	1.0	.7
86.7	10.0	.8	.6	.2	-	-
74.3	18.0	3.2	.7	.9	.6	-
65.9	16.4	13.1	.6	- ^a	.8	.4
70.8	15.7	9.5	.3	-	.5	.8
69.6	15.0	2.6	2.8 ^b	-	.6	-
83.0	11.8	.5	-	.9	-	1.6
76.8	14.6	6.0	.3	1.0	.2	.1

n Association, Research Division, Selected Statistics of Large School Systems,
(Washington: National Education Association, 1963), Tables J, K, L.

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TABLE 28

DEPENDENT VARIABLES FOR THIRTY-SEVEN CITY SCHOOL SYSTEMS--1962

	Current Educational Expenditures Per Student	Total Educational Expenditures Per Capita	Total Non- Aided Educational Expenditures Per Capita	Current Educational Expenditures As a Percent of All Local Current Expenditures
New York	\$536.88	\$ 77.29	\$47.10	24.7%
Chicago	408.51	66.09	50.78	28.6
Los Angeles	437.14	101.01	64.82	37.5
Philadelphia	397.75	54.69	37.24	29.5
Detroit	461.67	93.78	70.16	38.1
Baltimore	366.07	80.50	60.67	31.5
Houston	290.09	63.75	32.42	39.8
Cleveland	370.59	65.01	58.25	30.2
St. Louis	386.58	55.31	37.11	32.7
Milwaukee	377.96	65.20	51.77	23.5
San Francisco	466.77	69.19	45.47	22.4
Boston	385.46	50.32	43.78	18.8
Dallas	301.96	74.42	47.29	38.5
New Orleans	271.87	41.74	12.68	29.6
Pittsburgh	368.00	51.19	39.76	28.1
San Diego	414.63	105.13	67.70	34.5
Seattle	409.89	89.39	46.93	38.4
Buffalo	447.03	59.27	33.82	26.1
Cincinnati	373.11	62.90	55.07	29.4
Memphis	227.58	48.74	26.54	34.6
Denver	418.30	81.19	67.13	35.1
Atlanta	272.52	57.42	36.17	33.9
Minneapolis	414.31	61.42	41.91	30.2
Indianapolis	352.87	69.83	51.30	40.9
Kansas City	409.19	75.09	54.40	38.0
Columbus	327.40	61.25	51.97	37.7
Newark	496.21	93.80	78.32	31.4
Louisville	301.44	42.81	25.28	26.4
Portland, O.	421.59	79.37	58.32	45.9
Long Beach	426.33	85.99	51.08	34.2
Birmingham	194.43	49.93	18.23	37.5
Oklahoma	269.23	67.16	43.97	46.1
Rochester	580.05	79.35	54.79	31.3
Toledo	377.71	80.08	71.54	32.6
St. Paul	415.51	58.10	40.37	26.9
Norfolk	265.43	47.42	29.53	23.1
Omaha	282.58	49.48	43.88	33.3
Mean	376.33	67.96	47.23	32.4
Standard Deviation	82.46	16.16	14.74	6.2

Source: Calculated from: National Education Association, Selected Statistics of Large School Systems 1961-62, Research Report 1963-R-8 (Washington: National Education Association, 1963), Table L; U.S. Bureau of Census, U.S. Census of Governments: 1962 Compendium of Government Finances, Vol. IV, No. 4 (Washington: U.S. Government Printing Office, 1964); U.S. Bureau of Census, Compendium of City Government Finances, 1962 (Washington: U.S. Government Printing Office, 1963).

TABLE 29

INDEPENDENT VARIABLES: ATTITUDES, FOR THIRTY-SEV

	Median Family Income 1959	Percent Population with 12+ Years of Education 1960	Percent Owner- Occupied Dwelling Units 1960	Mobility Index 1960	Dropout Rate 1963	Current Educational Expenditures Per Student Outside CC 1962
New York	\$6,091	37.4	21.0	16.4	30.6	\$604.34
Chicago	6,738	35.2	32.6	15.1	30.6	473.69
Los Angeles	6,870	52.8	43.1	11.4	20.7	626.63
Philadelphia	5,782	30.7	58.7	8.4	46.9	492.90
Detroit	6,069	34.4	54.1	14.9	35.1	434.10
Baltimore	5,659	28.1	51.6	15.7	27.7	421.61
Houston	5,707	44.1	52.1	13.9	24.4	450.35
Cleveland	5,935	30.1	42.8	17.6	31.0	459.50
St. Louis	5,355	27.5	36.1	11.6	23.2	423.73
Milwaukee	6,664	39.7	46.3	18.2	21.0	469.38
San Francisco	6,717	51.0	32.9	13.2	31.2	519.49
Boston	5,747	44.6	25.6	4.9	34.3	465.36
Dallas	5,976	48.9	55.0	11.5	25.2	325.40
New Orleans	4,807	33.3	35.2	17.2	22.5	233.05
Pittsburgh	5,605	35.4	46.8	4.0	24.8	450.93
San Diego	6,614	55.0	48.1	11.9	14.7	538.95
Seattle	6,942	55.8	53.3	12.2	11.6	415.72
Buffalo	5,713	30.1	42.2	14.0	26.1	361.20
Cincinnati	5,828	34.5	40.2	12.0	32.4	577.74
Memphis	4,915	40.1	52.7	19.7	23.4	245.71
Denver	6,361	53.4	50.9	15.0	16.0	390.74
Atlanta	4,942	40.4	43.2	23.0	24.2	287.80
Minneapolis	6,401	48.4	50.5	23.0	19.6	442.23
Indianapolis	6,106	41.5	52.3	22.8	27.7	467.92
Kansas City	5,796	45.1	47.3	11.9	27.1	350.67
Columbus	5,988	44.2	48.7	18.9	32.1	332.06
Newark	5,454	27.2	21.4	4.7	29.5	522.23
Louisville	5,032	29.7	47.1	15.1	28.0	477.73
Portland, O.	6,346	50.0	59.7	10.9	N.A.	480.14
Long Beach	6,699	54.1	49.1	11.4	10.7	605.54
Birmingham	4,947	36.6	49.7	11.4	25.4	223.89
Oklahoma	5,495	48.0	56.4	11.0	17.7	291.67
Rochester	6,361	34.5	49.3	22.7	22.0	573.07
Toledo	6,299	38.2	60.5	19.4	26.6	511.85
St. Paul	6,543	46.1	58.2	23.7	3.9	452.83
Norfolk	4,894	40.8	43.6	21.8	24.9	288.65
Omaha	6,208	49.7	58.0	11.6	18.1	394.90
Mean	5,936	41.1	46.4	15.0	24.3	441.99
Standard Deviation	601	8.6	10.0	5.8	8.9	111.32

N.A. = Not available.

Sources: Calculated from: U.S. Bureau of Census, U.S. Census of Per
 (Washington: U.S. Government Printing Office, 1963); U.S. Bureau of Census, U.
 of Government Finances, Vol. IV, No. 4 (Washington: U.S. Government Printing
 Power/Large City School Systems Project: School Dropouts (Washington: National

TABLE 29

TABLES: ATTITUDES, FOR THIRTY-SEVEN CITY SCHOOL SYSTEMS

Mobility Index 1960	Dropout Rate 1963	Current Educational Expenditures Per Student Outside CC 1962	Current Educational Expenditures Per Capita Outside CC 1962	Percent Negro 1960	Percent Irish 1960	Percent Italian 1960	Percent Pole-Czech 1960
16.4	30.6	\$804.34	\$152.94	14.0	4.0	11.0	5.8
15.1	30.6	473.69	94.03	22.9	2.4	3.8	8.7
11.4	20.7	626.65	104.35	13.5	.7	2.1	2.2
8.4	46.9	492.90	90.16	26.4	2.9	6.4	3.1
14.9	35.1	434.10	165.21	28.9	.7	2.9	6.9
15.7	27.7	421.61	82.39	34.7	.7	1.9	2.7
13.9	24.4	450.35	116.67	22.9	.2	.7	.8
17.6	31.0	459.50	89.31	28.6	1.2	3.6	8.4
11.6	23.2	423.73	80.86	36.6	1.0	1.8	1.4
18.2	21.0	469.38	102.58	8.4	.4	1.5	6.4
13.2	31.2	519.49	120.27	10.0	3.0	5.6	1.2
4.9	34.3	465.36	36.09	9.1	10.7	8.5	1.9
11.5	25.2	325.40	73.29	19.0	.2	.4	.6
17.2	22.5	233.05	45.45	37.2	.3	2.6	.2
4.0	24.8	450.98	84.64	17.0	2.4	5.6	5.6
11.9	14.7	338.95	120.68	6.0	.7	1.6	.9
12.2	11.6	415.72	114.13	4.8	.9	1.2	.8
14.0	26.1	361.20	116.74	13.3	1.6	7.7	9.2
12.0	32.4	577.74	91.62	21.6	.8	1.0	.5
19.7	23.4	245.71	66.67	37.0	.2	.7	.3
15.0	16.0	380.74	108.53	6.1	.9	1.5	1.2
23.0	24.2	287.80	73.85	40.3	.1	.2	.3
23.0	19.6	442.23	95.17	2.4	.7	.4	2.7
22.8	27.7	467.92	103.75	20.6	.6	.4	.3
11.9	27.1	350.67	119.09	18.9	.8	1.5	.8
18.9	32.1	332.06	81.81	16.4	.4	1.4	.5
4.7	29.5	522.23	95.58	34.1	2.2	11.6	4.4
15.1	38.0	477.73	97.52	17.9	.4	.3	.2
10.9	N.A.	480.14	118.86	4.2	.8	1.4	.8
11.4	10.7	605.54	110.68	2.8	.8	1.1	.9
11.4	25.4	223.89	55.59	39.6	.1	.9	.1
11.0	17.7	291.67	66.41	11.5	.2	.1	.4
22.7	22.0	573.07	126.16	7.4	2.0	12.9	2.7
19.4	26.6	511.85	121.52	12.6	.7	.7	5.5
23.7	3.9	452.88	93.75	2.6	1.3	1.1	2.5
21.8	24.9	288.65	69.53	25.8	.3	.8	.8
11.6	18.1	394.90	103.36	8.3	.9	1.9	4.4
15.0	24.3	441.99	98.37	18.4	1.3	2.9	2.6
5.8	8.9	111.32	24.39	11.6	1.8	3.4	2.7

Bureau of Census, U.S. Census of Population and Housing: 1960, Census Tracts
 (Washington, 1963); U.S. Bureau of Census, U.S. Census of Governments: 1962 Compendium
 (Washington: U.S. Government Printing Office, 1964); Daniel Schreiber, Holding
 School Dropouts (Washington: National Education Association, 1964):

TABLE 30
INDEPENDENT VARIABLES: COST AND NEED, FOR THIRTY-SEVEN CITY SCHOOL SYSTEMS

	Cost			Need	
	Total Educational Expenditures Outside Central City Per Capita 1962	Beginning Teachers' Salary 1964	Total Public Enrollment (000) 1961	Public Enrollment as a Per- cent of Population 1962/60	Percent Populat 5-18 Years O 1960
New York	\$194.05	\$5,300	1,004	13.3	21.3
Chicago	112.60	5,350	489	14.4	22.7
Los Angeles	131.86	5,500	545	21.7	22.5
Philadelphia	105.59	5,300	250	12.9	23.2
Detroit	128.08	5,300	288	17.5	24.8
Baltimore	112.82	5,000	175	19.2	25.2
Houston	143.85	4,500	188	23.3	26.4
Cleveland	113.74	5,000	138	16.4	23.6
St. Louis	100.70	5,000	106	14.4	22.4
Milwaukee	124.75	5,275	107	15.1	24.0
San Francisco	132.52	5,840	93	12.4	18.9
Boston	100.97	4,930	91	13.3	22.6
Dallas	100.37	4,700	131	20.2	25.8
New Orleans	66.63	3,725	94	15.6	26.2
Pittsburgh	96.05	5,000	74	12.6	26.4
San Diego	156.29	5,500	110	19.9	27.0
Seattle	138.86	4,940	101	18.2	23.2
Buffalo	137.32	5,100	70	13.5	23.3
Cincinnati	118.29	4,900	82	15.5	23.7
Memphis	96.59	4,500	103	21.3	27.3
Denver	151.07	5,100	94	19.6	24.6
Atlanta	90.49	4,560	101	21.3	29.0
Minneapolis	132.57	5,150	71	14.9	22.6
Indianapolis	144.17	5,000	91	18.4	24.3
Kansas City	156.54	4,800	68	16.7	24.0
Columbus	98.08	4,700	88	19.7	24.4
Newark	112.08	5,600	66	16.3	23.1
Louisville	134.33	4,150	48	14.5	24.5
Portland, O.	149.10	5,000	75	18.6	23.7
Long Beach	142.46	5,525	73	19.0	23.5
Birmingham	61.49	4,100	70	21.2	26.7
Oklahoma	83.76	4,300	68	24.6	25.1
Rochester	158.58	5,150	42	13.9	22.1
Toledo	160.51	4,800	52	16.9	24.6
St. Paul	123.02	5,000	43	14.0	25.4
Norfolk	87.51	4,400	54	18.3	21.8
Omaha	136.83	5,100	52	17.6	25.7
Mean	122.82	4,950	145	17.2	24.2
Standard Deviation	27.60	443	179	3.2	1.9

Sources: Calculated from: U.S. Bureau of Census, U.S. Census of Governments of Government Finances, Vol. IV, No. 4 (Washington: U.S. Government Printing Office, Bureau of Census, U.S. Census of Population and Housing: 1960 Census Tracts (Washington: U.S. Government Printing Office, 1963); National Education Association, Research Division, Salary Schedules for Teachers 1964-65, Research Report 1964 R-13 (Washington: National Education Association, 1964).

TABLE 30

VARIABLES: COST AND NEED, FOR THIRTY-SEVEN CITY SCHOOL SYSTEMS

Cost		Need		
Beginning Teachers' Salary 1964	Total Public Enrollment (000) 1961	Public Enrollment as a Percent of Population 1962/60	Percent Population 5-18 Years Old 1960	Public Enrollment as a Percent of Total Enrollment 1960
\$5,300	1,004	13.3	21.3	66.3
5,350	489	14.4	22.7	67.6
5,500	545	21.7	22.5	95.8
5,300	250	12.9	23.2	61.2
5,300	283	17.5	24.8	74.1
5,000	175	19.2	25.2	85.0
4,500	188	23.3	26.4	98.9
5,000	138	16.4	23.6	76.9
5,000	106	14.4	22.4	72.1
5,275	107	15.1	24.0	65.3
5,840	93	12.4	18.9	65.1
4,930	91	13.3	22.6	60.9
4,700	131	20.2	25.8	94.6
3,725	94	15.6	26.2	65.2
5,000	74	12.6	26.4	57.5
5,500	110	19.9	27.0	88.2
4,940	101	18.2	23.2	79.3
5,100	70	13.5	23.3	61.7
4,900	82	15.5	23.7	71.6
4,500	103	21.3	27.3	88.8
5,100	94	19.6	24.6	85.2
4,560	101	21.3	29.0	90.2
5,150	71	14.9	22.6	65.9
5,000	91	18.4	24.3	84.7
4,800	68	16.7	24.0	86.0
4,700	88	19.7	24.4	83.5
5,600	66	16.3	23.1	79.6
4,150	48	14.5	24.5	70.5
5,000	75	18.6	23.7	80.6
5,525	73	19.0	23.5	86.7
4,100	70	21.2	26.7	94.9
4,300	68	24.6	25.1	90.4
5,150	42	13.9	22.1	65.8
4,800	52	16.9	24.6	72.5
5,000	43	14.0	25.4	56.1
4,400	54	18.3	21.8	90.6
5,100	52	17.6	25.7	72.7
4,950	145	17.2	24.2	77.0
443	179	3.2	1.9	12.0

from: U.S. Bureau of Census, U.S. Census of Governments: 1962 Compendium
 IV, No. 4 (Washington: U.S. Government Printing Office, 1964); U.S.
Bureau of Population and Housing: 1960 Census Tracts (Washington: U.S. Government
 Printing Office, 1964); National Education Association, Research Division, Salary Schedules for Classroom
Teachers: Report 1964 R-13 (Washington: National Education Association, 1964).

TABLE 11
INDEPENDENT VARIABLES: ABILITY, NON-EDUCATIONAL DEMANDS, INTERGOV
FISCAL RELATIONS, FEEDBACK FOR THIRTY-SEVEN CITY SCHOOL SYST

	Ability to Pay		Non- Educational Demands	Intergovernmental Fiscal Relations	
	Percent Non- Residential Assessed Value 1962	Educational Taxes Paid by Non- Residential Property 1962	Current Non- Educational Expenditures Per Capita 1962	State Aid to Local Schools Per Student 1962	State Aid to Local Schools Per Capita 1962
New York	44.4	\$20.91	\$210.60	\$233.98	\$30.19
Chicago	42.5	21.58	120.41	111.14	15.31
Los Angeles	30.5	19.77	156.13	172.94	36.19
Philadelphia	39.1	14.56	113.68	139.80	17.45
Detroit	42.5	29.82	88.34	136.98	23.62
Baltimore	29.2	17.72	149.32	105.41	19.83
Houston	40.5	13.13	71.83	142.82	31.33
Cleveland	57.8	33.67	122.03	49.93	6.76
St. Louis	49.5	18.37	112.86	128.77	18.20
Milwaukee	38.5	19.93	159.37	93.04	13.43
San Francisco	45.8	20.83	192.69	188.71	23.72
Boston	57.9	25.35	210.60	50.12	6.54
Dallas	39.0	18.44	61.73	139.77	27.13
New Orleans	32.3	4.09	91.78	194.15	29.06
Pittsburgh	48.3	19.20	87.58	93.31	11.43
San Diego	26.2	17.74	124.29	195.00	37.43
Seattle	41.6	19.52	93.36	234.16	42.46
Buffalo	48.8	16.50	137.11	193.79	25.45
Cincinnati	35.8	19.72	113.27	51.16	7.83
Memphis	35.4	9.40	80.09	107.45	22.22
Denver	36.1	24.23	142.54	73.88	14.06
Atlanta	48.0	17.36	95.86	102.48	21.25
Minneapolis	50.4	21.12	114.93	132.75	19.51
Indianapolis	37.2	19.08	82.25	96.98	18.53
Kansas City	43.2	23.50	76.88	129.04	20.69
Columbus	29.6	15.38	94.12	50.17	9.28
Newark	53.3	41.74	169.63	94.98	15.48
Louisville	42.5	10.74	76.80	123.44	17.53
Portland, O.	37.9	22.10	87.36	114.67	21.05
Long Beach	23.1	11.80	137.52	186.99	34.91
Birmingham	42.9	7.82	57.41	154.42	31.70
Oklahoma	24.8	10.90	56.34	96.45	23.19
Rochester	55.3	30.30	142.92	186.52	24.56
Toledo	36.2	25.90	108.51	51.63	8.44
St. Paul	50.0	20.19	136.23	129.82	17.73
Norfolk	29.7	8.77	149.82	101.04	17.89
Omaha	28.7	12.59	20.09	33.17	5.60
Mean	40.4	19.02	116.48	124.92	20.73
Standard Deviation	9.1	7.34	39.76	51.82	9.09

Sources: Calculated from: National Education Association, Selected Statistics 1961-62, Research Report 1963-R-8 (Washington: National Education Association, 1963) and Census, U.S. Census of Governments: 1962 Compendium of Government Finances, Vol. IV, N (Washington: U.S. Government Printing Office, 1964); U.S. Bureau of Census, Compendium of City Government (Washington: U.S. Government Printing Office, 1963); U.S. Bureau of Census, County and A Statistical Abstract Supplement (Washington: U.S. Government Printing Office, 1953).

TABLE 11.

NT VARIABLES: ABILITY, NON-EDUCATIONAL DEMANDS, INTERGOVERNMENTAL
CAL RELATIONS, FEEDBACK FOR THIRTY-SEVEN CITY SCHOOL SYSTEMS

to Pay	Non- Educational Demands	Intergovernmental Fiscal Relations		Feedback	
	Current Non- Educational Expenditures Per Capita 1962	State Aid to Local Schools Per Student 1962	State Aid to Local Schools Per Capita 1962	Capital Expenditures for Education Per Student 1957	Median Family Income 1949
Educational Taxes Paid by Non- Residential Property 1962					
\$20.91	\$210.60	\$233.98	\$30.19	\$107.99	\$3,526
21.58	120.41	111.14	15.31	60.70	3,956
19.77	156.13	172.94	36.19	193.57	3,575
14.56	113.62	139.80	17.45	69.61	3,322
29.82	88.34	136.98	23.62	31.79	3,955
17.72	149.32	105.41	19.83	69.38	3,275
13.13	71.83	142.82	31.33	111.20	3,389
33.67	122.03	49.93	6.76	41.30	3,531
18.37	112.86	128.77	18.20	37.78	3,205
19.93	159.37	93.04	13.43	90.11	3,800
20.83	192.69	168.71	23.72	52.40	3,923
25.35	210.60	50.12	6.54	51.47	3,249
18.44	61.73	139.77	27.13	120.92	3,526
4.09	91.78	194.15	29.06	74.50	2,767
19.20	87.58	93.31	11.43	5.88	3,314
17.74	124.29	195.00	37.43	71.80	3,554
19.52	93.36	234.16	42.46	59.02	3,947
16.50	137.11	193.79	25.45	52.45	3,401
19.72	113.27	51.16	7.83	54.19	3,186
9.40	80.09	107.45	22.22	35.44	2,859
24.23	142.54	73.88	14.06	90.53	3,554
17.36	95.86	102.48	21.25	14.43	2,664
21.12	114.93	132.75	19.51	51.49	3,784
19.08	82.25	96.98	18.53	67.86	3,555
23.50	76.88	129.04	20.69	53.45	3,401
15.38	94.12	50.17	9.28	99.56	3,660
41.74	169.63	94.98	15.48	75.32	3,288
10.74	76.80	123.44	17.53	40.07	3,166
22.10	87.36	114.67	21.05	55.15	3,719
11.80	137.52	136.99	34.91	118.62	3,605
7.82	57.41	154.42	31.70	39.88	2,826
10.90	56.34	96.45	23.19	142.25	3,248
30.30	142.92	186.52	24.56	41.77	3,561
25.90	108.51	51.63	8.44	21.52	3,968
20.19	136.23	129.82	17.73	40.78	3,780
8.77	149.82	101.04	17.89	21.44	3,097
12.59	20.09	33.17	5.60	86.76	3,449
19.02	116.48	124.92	20.73	63.88	3,448
7.34	39.76	51.82	9.09	38.30	335

from: National Education Association, Selected Statistics of Large School Systems
R-8 (Washington: National Education Association, 1963) Table L; U.S. Bureau of
ments: 1962 Compendium of Government Finances, Vol. IV, No. 4 (Washington: U.S.
1964); U.S. Bureau of Census, Compendium of City Government Finances, 1962
Printing Office, 1963); U.S. Bureau of Census, County and City Data Book, 1952,
ment (Washington: U.S. Government Printing Office, 1953).

APPENDIX B

SIMPLE CORRELATION MATRIX

TABLE 32
SIMPLE CORRELATION MATRIX

	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀
X ₁	-	.606	.605	-.219	.618	-.007	-.311	-.130	-.032	.605
X ₂		-	.831	.378	.628	.345	.037	-.154	-.266	.284
X ₃			-	.209	.592	.162	.012	-.151	-.085	.394
X ₄				-	.057	.326	.559	-.037	-.372	-.275
X ₅					-	.551	.147	-.076	-.349	.355
X ₆						-	.299	-.040	-.591	-.205
X ₇							-	.196	-.344	-.272
X ₈								-	-.115	-.107
X ₉									-	.238
X ₁₀										-
X _{10.1}										
X ₁₁										
X ₁₂										
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X ₃₀										

X10.1	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23
.735	-.450	.355	.668	.417	.665	.774	.349	-.529	-.622	-.439	.367	.698	.624
.610	-.313	-.100	.129	.102	.560	.610	.267	.249	-.173	.309	-.177	.537	.230
.562	-.306	.050	.178	.297	.512	.667	.133	.055	-.219	.092	-.042	.768	.303
.024	.034	-.546	-.447	-.363	.037	-.198	-.110	.749	.400	.651	-.398	-.077	-.691
.599	-.755	.100	.060	.269	.623	.733	.219	-.145	-.406	-.173	.451	.362	.319
.167	-.667	-.021	-.360	-.413	.284	.188	-.065	.399	.009	.339	-.384	-.152	-.017
.008	-.236	-.537	-.583	-.205	.058	-.213	-.409	.412	.437	.249	-.394	-.269	-.641
-.052	.108	-.385	-.277	-.068	.043	-.231	-.035	.127	.186	.067	.025	-.112	-.053
-.025	.477	.306	.308	.299	-.182	-.028	.232	-.319	-.190	-.188	.230	.094	.106
.526	-.237	.317	.497	.430	.516	.465	.423	-.451	-.421	-.410	.384	.517	.434
-	-.474	.133	.320	.381	.868	.614	.376	-.233	-.367	-.181	.126	.494	.301
-	-	-.195	-.040	-.048	-.603	-.419	.041	.170	.338	.260	.093	-.134	-.249
-	-	-	.624	.205	.061	.308	.219	-.521	-.410	-.489	.476	.317	.625
-	-	-	-	.439	.221	.426	.323	-.571	-.469	-.489	.538	.513	.611
-	-	-	-	-	.212	.430	.343	-.465	-.221	-.505	.367	.471	.300
-	-	-	-	-	-	.525	.335	-.178	-.330	-.100	.029	.385	.295
-	-	-	-	-	-	-	.291	-.351	-.521	-.263	.151	.595	.599
-	-	-	-	-	-	-	-	-.095	-.285	-.038	-.009	.087	.373
-	-	-	-	-	-	-	-	-	.541	.916	-.571	-.307	-.488
-	-	-	-	-	-	-	-	-	-	.368	-.249	-.346	-.641
-	-	-	-	-	-	-	-	-	-	-	-.490	-.224	-.391
-	-	-	-	-	-	-	-	-	-	-	-	.587	.270
-	-	-	-	-	-	-	-	-	-	-	-	-	.403
-	-	-	-	-	-	-	-	-	-	-	-	-	-

	X ₁₆	X ₁₇	X ₁₈	X ₁₉	X ₂₀	X ₂₁	X ₂₂	X ₂₃	X ₂₄	X ₂₅	X ₂₇	X ₂₈	X ₂₉	X ₃₀
624	.774	.349	-.529	-.632	-.439	.367	.698	.624	.130	.258	.361	.097	.103	.598
230	.610	.267	.249	-.173	.309	-.177	.537	.230	.286	-.125	.312	.429	.413	.543
303	.667	.133	.055	-.219	.092	-.042	.768	.303	.257	-.088	-.204	-.145	.184	.595
691	.198	-.110	.749	.400	.651	-.398	-.077	-.691	.325	.036	.004	.334	.286	.040
319	.733	.219	-.145	-.406	-.173	.451	.362	.319	.363	-.063	.200	.155	.336	.885
017	.188	-.065	.399	.009	.339	-.384	-.152	-.017	.376	-.055	.153	.351	.393	.355
641	.213	-.409	.412	.437	.249	-.394	-.269	-.641	.261	.072	-.152	.045	.025	.189
053	.231	-.035	.127	.186	.067	.025	-.112	-.053	-.129	-.076	-.023	-.027	-.297	-.045
106	.028	.232	-.319	-.190	-.188	.230	.094	.106	-.332	.284	-.186	-.335	-.206	-.188
434	.465	.423	-.451	-.421	-.410	.384	.517	.434	.028	-.126	.076	-.135	.061	.376
801	.614	.376	-.233	-.367	-.181	.126	.494	.301	.251	.137	.301	.171	.092	.672
249	.419	.041	.170	.338	.260	.093	-.134	-.249	-.267	.093	-.128	-.059	-.256	-.667
625	.308	.219	-.521	-.410	-.489	.476	.317	.625	-.207	-.099	-.061	-.258	-.056	.063
511	.426	.323	-.571	-.469	-.489	.538	.513	.611	-.278	-.182	.243	-.059	-.031	.055
800	.430	.343	-.465	-.221	-.505	.367	.471	.300	-.007	-.037	-.082	-.301	-.091	.412
295	.525	.335	-.178	-.330	-.100	.029	.385	.295	.227	-.177	.274	.163	.213	.599
699	-	.291	-.351	-.521	-.263	.151	.595	.599	.189	.090	.143	.004	.202	.636
373	-	-.095	-.285	-.038	-.009	.087	.373	.012	-.081	.359	.259	.407	.174	
488	-	-	.541	.916	-.571	-.307	-.488	.100	.116	-.092	.354	.384	-.237	
641	-	-	-	.368	-.249	-.346	-.641	-.087	.188	-.220	.046	-.110	-.473	
991	-	-	-	-	-.490	-.224	-.391	.111	.093	-.012	.400	.354	-.259	
270	-	-	-	-	-	.587	.270	-.042	-.138	-.000	-.246	-.407	.038	
103	-	-	-	-	-	-	.403	.162	-.187	-.183	-.292	-.103	.469	
-	-	-	-	-	-	-	-	-.155	-.242	.148	.082	.116	.225	
-	-	-	-	-	-	-	-	-	-.537	.017	.091	.259	.350	
-	-	-	-	-	-	-	-	-	-	-.145	-.081	-.149	-.068	
-	-	-	-	-	-	-	-	-	-	-	.886	.281	.096	
-	-	-	-	-	-	-	-	-	-	-	-	.437	-.000	
-	-	-	-	-	-	-	-	-	-	-	-	-	.108	

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